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KALA AZAR.

NAPIER (L. Everard) & KRISHNAN (K. V.). **Kala-Azar in Madras and its Bearing on Epidemiology of the Disease in India.**—*Indian Jl. Med. Res.* 1933. July. Vol. 21. No. 1. pp. 155–172. With 2 charts & 1 map.

The incidence of kala azar in Madras city as discussed in this paper is based on 3 surveys, covering the periods 1904–1911, 1913–1922 and 1923–1931, made by examination of the records of the large hospitals in the city. The conclusion is reached that in Madras the disease is truly endemic and is not subject to variations from year to year. In Assam, on the other hand, it is epidemic and disappears almost entirely from certain areas in the inter-epidemic periods. In Bengal there is an intermediate condition, kala azar being endemic more or less throughout the province but subject to periodic increases in incidence.

As regards endemic areas outside Madras city there is no evidence of change in incidence from year to year, the disease in some cases having been known for fifty years. Furthermore it is noted that this stationary condition has occurred in spite of treatment, so that it is obvious that kala azar in Madras cannot be controlled by treatment of cases alone.

It has been supposed that cases of post-kala azar dermal leishmaniasis were rare in Madras but the investigation has shown that they are actually more common than in Bengal. It thus appears that with increasing endemicity of the disease, which is dependent on a better adaptation of parasite to host, the dermal cases increase also. In this respect Bengal occupies an intermediate position between Assam and Madras. In Assam the authors' view is that the disease either kills the patient or is cured by the relatively rapid development of a complete immunity. In Bengal, the population having some general immunity as a result of repeated epidemics in the past, the disease is less severe, so that complete immunity is less frequently developed. Chronic cases become more frequent and these lead to the establishment of the parasites in the skin where in many individuals they appear to exist and multiply with the minimum of disturbance to the host. In Madras the condition of complete adaptation of host to parasite is still further approached, in the greater incidence of skin cases and the lack of fluctuations in the incidence of the disease. The skin condition

being once established, it is supposed that the transmission from man to man of parasites from the skin will more readily lead to skin infections than if the parasites transmitted were those in the blood which had come from the internal organs. In other words it is assumed that with long exposure to infection not only does the host change but the parasite also.

In an appendix to the paper the second author gives details of the survey made by him in 1932, in Madras city and villages outside this area. One interesting point is that in Kayalpatnam, a kala azar centre; *Phlebotomus argentipes* was captured for the first time. Its apparent absence in the past has been regarded by some as an argument against the theory of sandfly transmission. *C. M. W.*

SERGENT (Edm.), SERGENT (Et.), PARROT (L.), DONATIEN (A.) & LESTOQUARD (F.). Revue historique du problème de la transmission des leishmanioses. [**Historical Review of the Problem of Transmission of the Leishmanial Infections.**]—*Bull. Soc. Path. Exot.* 1933. Feb. 8 & 9. Vol. 26. No. 2. pp. 224–248. [Refs. in footnotes.]

This is a valuable historical account of the observations and researches which have led to the incrimination of sandflies as the vectors of kala azar and oriental sore.

The first suspicions that these insects might be vectors of leishmania resulted from observations made by the brothers SERGENT on oriental sore at Biskra in 1904. They went so far as to carry out a number of feeding experiments on themselves with these flies and recorded their results in 1905. Since then a vast amount of experimental work has been done in N. Africa, India, China, Palestine, Sicily, Malta and other places with the result that there is now a fairly general conviction that the transmitting host of the various leishmaniases are sandflies of the genus *Phlebotomus*. The whole of this experimental work is reviewed in the article, which must be read in its entirety by those who wish to have an up-to-date knowledge of the subject. *C. M. Wenyon.*

ADLER (S.). Mode de transmission des protozoaires sanguicoles et particulièrement des leishmanioses. (Rapport introductif.) [**Mode of Transmission of Blood Protozoa and Especially Leishmania.**]—*Bull. Soc. Path. Exot.* 1933. Feb. 8 & 9. Vol. 26. No. 2. pp. 207–222. [35 refs.]

Adler here discusses the methods of transmission of blood protozoa and summarizes the results of a number of years of research into the method of transmission of leishmania infections.

In considering the transmission of the blood-inhabiting protozoa the author deals firstly with the Sporozoa, the blood forms of which appear to have been evolved from intestinal coccidia. The exact mechanism of transmission depends upon the type of development in the transmitting host. In the case of the haemogregarines the vertebrate becomes infected by eating the invertebrate in which development of sporozoites has taken place in its body cavity, while with the malarial parasites the more highly organized development in the invertebrate, leading to the infection of the salivary glands with

sporozoites, is associated with transmission by the bite. Similarly, with the haemoflagellates the exact method by which the invertebrate conveys infection to the vertebrate depends upon the site of development in the invertebrate. In the more primitive trypanosomes development leads to infection of the hind gut of the insect which passes on its infection to the vertebrate which devours it. A more specialized development in insects leads to infection of the proboscis or even the salivary glands with consequent transmission by the bite. Whether these vertebrate trypanosomes were originally parasites of insects or inhabitants of the intestine of vertebrates is a matter of opinion. The author favours the former view and considers that a purely insect parasite secondarily became adapted to life in the body of the vertebrate. It seems probable that certain intestinal leptomonas infections of lizards are acquired by the lizard eating infected insects. In certain lizards the leptomonads have acquired the property of invading the blood stream where they are exposed to ingestion by blood-sucking insects, such as sandflies, which in some cases are the actual transmitters of the infection. Some trypanosome infections of lizards are likewise conveyed by sandflies by these insects being eaten by the vertebrate.

The above considerations lead the author to the question of the relationship of sandflies to the various leishmania which develop in these insects. In the case of the leishmania of lizards one form in the sandfly develops in the hind gut while another adopts an anterior position. In the former case infection would be by ingestion of the sandfly while in the latter infection by the bite is a possibility. Similarly, in the case of the human leishmania though there is a tendency for some development to occur in all sandflies, it is much more marked in some than in others, while the degree of extension forwards towards the proboscis varies. Generally the parasite of visceral leishmaniasis is associated with sandflies of the *major* group—*Phlebotomus argentipes* in India, *P. chinensis* in N. China, *P. perniciosus* in Italy, Malta and Algeria, and *P. major* in Greece, while oriental sore occurs where *P. papatasii*, *P. sergenti* or *P. caucasicus* are found. It is in these species that the most active development occurs, but even amongst them there are considerable variations, all of which are dealt with by the author, who believes, for instance, that the marked tendency shown by *Leishmania infantum* to adopt an extreme anterior position in the sandfly is an indication that this parasite is transmitted by the actual bite, leading to the high percentage of infantile infections in the Mediterranean region, as also those of dogs. On the other hand the parasite of Indian kala azar does not extend forwards in *P. argentipes* to the same extent, so that infection by the bite is less likely to occur. Only adults, or at least those capable of crushing infected sandflies on the skin, are exposed to the danger of contracting the disease.

The above points are but a few of those dealt with. *C. M. W.*

Napier (L. Everard), Smith (R. O. A.) & Gupta (C. R. Das). **The Infection of *Phlebotomus argentipes* from Dermal Leishmanial Lesions.**—*Indian Jl. Med. Res.* 1933. July. Vol. 21. No. 1. pp. 173–177.

Cases of post-kala azar with skin lesions, even obscure, constitute a good source of infection for sandflies.

In 1928 SHORTT, D'SILVA & SWAMINATH showed that *Phlebotomus argentipes* became infected with leishmania when fed on a nodule in a case of post-kala azar dermal leishmaniasis [this *Bulletin*, Vol. 26, p. 325]. At about the same time this observation was repeated at Calcutta by " some of the writers," one of a batch of sandflies which had fed on a nodule being found infected. An attempt to infect sandflies from the depigmented lesions of the skin failed. A further attempt was made in 1932, the results of which are recorded in this paper. In this case the whole limb of a case showing depigmented patches was exposed to the bites of sandflies. The fed flies were not dissected at once but were re-fed one to three times on healthy mice in order to give time for the development of any parasites which might have been ingested. The flies were dissected as they died and gave a final percentage of 30 per cent. infected. The precentage found infected increased with the number of feeds. A further batch of 20 flies were fed on the arm of a woman with lesions so indistinct that they had been overlooked not only by a medical man who examined her but by the woman herself. Of these one became infected. It is also noted that a few years ago the first author examined wild sandflies in Calcutta for natural infection. The procedure of feeding the sandflies one or more times on clean mice before dissection was adopted. One of the sandflies was found infected. As a result of the experiments it is concluded that the cases with skin lesions are an abundant source of infection to sandflies and that this is not limited to cases with obvious lesions. *C. M. W.*

NAPIER (L. Everard), SMITH (R. O. A.) & KRISHNAN (K. V.). **The Transmission of Kala-Azar to Hamsters by the Bite of the Sandfly** *Phlebotomus argentipes.—Indian Jl. Med. Res.* 1933. Oct. Vol. 21. No. 2. pp. 299–304.

In recording the successful transmission of kala azar to hamsters by the bites of infected *Phlebotomus argentipes*, the authors review the previous attempts, including the one successful effort of SHORTT, SMITH, SWAMINATH and KRISHNAN (this *Bulletin*, Vol. 29, p. 107), wherein one hamster fed upon by infected sandflies was found infected on the 511th day after the commencement of the experiment.

The present experiment involved 28 hamsters which fell into three groups. In one group of 11 the average number of infected flies fed on each was estimated at 39. The animals were killed between the 419th and 629th days of the experiment. One animal killed on the 419th day was infected. A liver puncture on one on the 435th day yielded what appeared to be a single typical parasite, but when killed on the 583rd day it showed no infection. The first result may indicate that the animal was recovering from a transitory infection. In a second group of 9 hamsters the average number of infected flies fed on each was probably 33. In one animal, which died on the 482nd day, a heavy infection was found. In the third group occurred 8 hamsters. As regards the number of infected flies and the duration of the experiment the figures are much below those of the other groups. No infections resulted. It is noteworthy that where positive results were obtained the feedings were carried out during a period of high atmospheric humidity, while the animals survived over 400 days.

C. M. W.

Napier (L. Everard), Smith (R. O. A.) & Krishnan (K. V.). **The Relative Infectivity of the Two Forms of *Leishmania donovani* administered by Different Routes.**—*Indian Jl. Med. Res.* 1933. Oct. Vol. 21. No. 2. pp. 305–314.

The two forms referred to in the title are the flagellate culture form and the round tissue form from infected organs of hamsters, and both were administered to Chinese hamsters by five different routes, namely intraperitoneally, subcutaneously, orally, percutaneously and conjunctivally. A high percentage of infections was produced by both forms of the parasite by all routes. Except by the conjunctival route the flagellate form was always the more infective, while for the various routes the infection rate was in the order given above. Of 89 animals used for the flagellate infections 73 were proved to have acquired infection, while of the 63 in the leishmania series 45 became infected. The infection rate is higher than that obtained by other workers, but this is accounted for by the fact that the animals were kept longer before examination, while the culture method was used to aid diagnosis of infection. *C. M. W.*

Giraud (Paul) & Cabassu (Henri). Le chien est-il le réservoir de virus de la leishmaniose interne. [**Is the Dog a Reservoir of K.A. ?**] —*Arch. Méd. Gén. et Colon.* 1933. Jan. Vol. 2. No. 1. pp. 23–27.

Owing to the frequent occurrence of leishmania in the skin of dogs suffering from kala azar in and around Marseilles the authors are led to suggest that this is due to the repeated wounding of the skin by ticks infected with leishmania. Similarly they think that the dermal infections seen in some human cases in India may also be due to repeated skin inoculations by infected insects. As regards the Mediterranean disease they believe that the banishing of dogs from the neighbourhood of children and the careful destruction of ticks which they have left behind in the gardens will at least check the disturbing extension of the human disease which has taken place. Unfortunately, no experimental evidence is produced to prove that the dog tick is capable of spreading the infection. *C. M. W.*

Parrot (L.), Donatien (A.) & Lestoquard (F.). Notes et réflexions sur la biologie de *Phlebotomus perniciosus* Newstead en Algérie. [**Biology of *P. perniciosus* in Algeria.**]—*Arch. Inst. Pasteur d'Algérie.* 1933. June. Vol. 11. No. 2. pp. 183–191. With 1 fig. [20 refs.]

These notes refer to the distribution, incidence and habits of *Phlebotomus perniciosus* in Algeria, all of which afford arguments in favour of this sandfly being regarded as the vector of kala azar.

It has already been shown by the authors (1930) that it became infected with leptomonad flagellates after feeding on cases of canine kala azar. An interesting point regarding the larvae is that breeding experiments have shown that they develop quite well in the laboratory after hatching from eggs laid by captured females when given no other food than dry leaves of the tree *Ulmus campestris*. The development from the egg to the fly at a temperature of 22°C.–24°C. occupies 134 to 216 days. This habit of the larvae of feeding satisfactorily on leaves agrees with the observation that the sandflies are associated with

vegetation. NAPIER has stated that in Calcutta kala azar appears to be associated with the presence of vegetation which indicates a plant-feeding insect or vector. *C. M. W.*

NATTAN-LARRIER (L.) & GRIMARD-RICHARD (L.). Une méthode de diagnostic de la leishmaniose viscérale. [**Method of Diagnosis of K.A.**]—*C. R. Soc. Biol.* 1933. Vol. 113. No. 28. pp. 1489–1492.

The authors describe a new serological test for leishmania infections. It is based on the fact that alexine is adsorbed by a mixture of the serum from a case of leishmania infection and the serum of a rabbit which has been immunized with cultures of *Leishmania donovani*. The rabbit serum is prepared by injecting a rabbit intravenously with a culture every 6 days till 6 injections have been given. The blood is abstracted 15 days after the last injection, defibrinated and centrifuged, the resulting serum being placed in ampoules which are kept in the ice chest. The test is carried out in two ways. In the first 0·1 cc. of alexine, 0·1 cc. of the suspected inactivated leishmania serum, decreasing quantities (one-tenth to one hundred millionth of 1 cc.) of the rabbit serum (inactivated if fresh) and 0·2 cc. of physiological saline solution are mixed in tubes and kept at a temperature of 37°C. for 1½ hours. To each tube are then added 0·1 cc. of antisheep serum and 0·1 cc. of 5 per cent. suspension of sheep corpuscles. The tubes are then kept at 37°C. for ½ hour. If the suspected serum was actually from a case of leishmania infection haemolysis does not occur owing to fixation of the alexine. In the second way of making the test the suspected serum is present in decreasing quantities the other ingredients being uniform.

The two methods give good results but the second is preferable if small quantities only of suspected serum are available. Positive results have been obtained with one human and six canine cases of kala azar and with mice suffering from *Leishmania tropica* infection of the tail. The authors think that because of its simplicity the test will be of practical use in the diagnosis of kala azar. Previous tests based on fixation of the complement had to rely on leishmania antigens which which were not only difficult to prepare but were unstable. In the present case the rabbit serum is easily made and can be easily stored. The quantity of suspected serum required for the first method is 1 cc. and that for the second only a fifth of this. Furthermore the test may be carried out even when the sample of suspected serum is not in the best condition of preservation. *C. M. W.*

MUDALIYAR (M. R. Guruswami), SUNDARAM (S. K.) & RAMACHANDRAN (A. S.). **An Investigation on the Diagnostic Value of Serum Protein Changes in Kala-Azar.**—*Indian Jl. Med. Res.* 1933. Oct. Vol. 21. No. 2. pp. 361–378. [13 refs.]

It has already been noted that certain serum changes occur in kala azar in the direction of an increase in the total globulin at the expense of the albumin. At the same time the globulin shows an increase in the proportion of euglobulin to pseudoglobulin. It has been shown by LLOYD and his co-workers that with the progress in cure of kala azar the serum returns progressively to normal [this *Bulletin*, Vol. 26, p. 744]. The authors of the present paper have examined the serum

of kala azar cases and those of other diseases with a view to determining the diagnostic value in kala azar of the protein changes. They record their results in a series of tables and conclude that though no absolute diagnosis can be based on the changes these are of definite help in certain obscure cases. *C. M. W.*

GIRAUD (P.), MONTUS & CIAUDO. Valeur de la réaction de Chopra à l'uréastibamine pour le diagnostic de la leishmaniose interne. [**Value of Chopra's Urea Stibamine Reaction for Diagnosis of K.A.**] —*Bull. Soc. Path. Exot.* 1933. Nov. 8. Vol. 26. No. 9. pp. 1156–1160. With 1 fig.

Having tested the value of the formol-gel reaction and the urea stibamine reaction in cases of infantile and canine kala azar the authors find that the one is as good as the other, though both are unreliable to the extent that a diagnosis of kala azar cannot be made by them alone.

As regards the urea stibamine reaction a positive obtained with a dilution of one in ten, as advocated by CHOPRA, is of little value. With dilutions of one in 1,000 there is considerable specificity but not more so than the easily carried out formol-gel reaction. It is evident that a more specific serological test is required if it is to replace the search for parasites as a means of diagnosis. In a discussion other speakers agreed that a one in ten solution of urea stibamine was too concentrated for the results given with it to be reliable. *C. M. W.*

KASSIRSKY (J. A.). Einige Bemerkungen zur Methodik der Knochenmarkpunktion bei der viszeralen Leishmaniose und die heilprophylaktische Bedeutung dieser Methodik. [**Bone Marrow Puncture in K.A. and its Significance for Treatment.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Nov. Vol. 37. No. 11. pp. 496–499. With 1 fig.

Having carried out puncture of the sternum in order to obtain bone marrow for the diagnosis of kala azar in over 60 cases in Tashkent the author advocates the method as being preferable to others, especially in children. He describes the operation as being as simple as finger puncture for the preparation of blood films. The instrument used is a hypodermic needle 1 to 1·5 mm. in diameter, provided with a collar which can be fixed at any desired distance from the point by a screw. This distance varies from 0·5 to 0·8 cm. according to the development of the patient. It is claimed that by this method a diagnosis as early as the third or fourth week of the disease can be made. *C. M. W.*

RAYNAL (J.) & LE GAC (P.). Leishmaniose viscérale infantile et phlébotomes à Marseille. [**Infantile Kala Azar and Phlebotomus at Marseilles.**]—*Bull. Soc. Path. Exot.* 1933. Feb. 8 & 9. Vol. 26. No. 2. pp. 249–251.

Attention has recently been drawn to the frequence of infantile kala azar in the south-east of France. In Marseilles it is progressing from year to year, though limited to the suburban littoral districts, Studying the sandflies in Marseilles the authors have found three species, *Phlebotomus perniciosus*, *P. papatasii* and *P. larroussei*, the first named constituting 97 per cent. of the captures. Not only is this species most numerous in the total catches but its density is greatest in

the very places in which infantile kala azar is endemic. It would seem that, as demonstrated by ADLER and THEODOR in Sicily, this sandfly is the vector in Marseilles. *C. M. W.*

D'OELSNITZ & CARCOPINO (E.). Un cas de kala-azar autochtone de l'adulte avec production d'ascite au cours du traitement stibié. Guérison par l'uréa stibamine. [**Case of K.A. in which Ascites appeared in the course of Antimony Treatment. Cure by Urea Stibamine.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1933. Nov. 6. 3rd Ser. 49th Year. No. 26. pp. 1165–1170.

—— & ——. Effets favorables de l'uréa stibamine dans le traitement des formes stibio-résistantes du kala-azar.—*Ibid.* pp. 1171–1174.

Urea stibamine was found of great value, especially in cases which had proved resistant to other forms of antimony.

The first paper describes a case of kala azar in an adult 24 years of age, the disease having been contracted in the South of France. Treatment with neostibosan, though reducing the temperature, did not improve the general condition, for there developed oedema and ascites estimated at 4 or 5 litres of fluid. Urea stibamine was then tried. There followed immediate improvement which was continued to the disappearance of all subjective symptoms and a return of the general appearance to the normal. The spleen, however, remained tender and slightly enlarged and the blood gave a positive formol-gel and antimony reaction while its albumin and globulin ratio had not become readjusted. The authors note that the persistence of these abnormalities is no indication that a cure has not taken place.

In the second paper four cases of kala azar are mentioned to illustrate the value of urea stibamine in the treatment of the disease. It is of special value in cases which have proved resistant to other antimony compounds. The authors find that the only drawback to its use is the difficulty of obtaining it in France. *C. M. W.*

MÜHLENS (P.). Ein Fall von Kala-Azar an Bord eines deutschen Schiffes. [**Case of K.A. on Board Ship.**]—*Deut. Med. Woch.* 1933. Oct. 20. Vol. 59. No. 42. pp. 1599–1601. With 4 figs.

The description of a case of kala azar in a seaman 38 years of age. Fever from which the patient suffered was at first thought to be due to malaria as subtertian parasites were discovered in the blood on two occasions. The infection, probably acquired in the Mediterranean region, was eradicated by a course of neostibosan. *C. M. W.*

NAPIER (L. Everard) & SHARMA (L. R.). **The Anaemia of Kala-Azar.** —*Indian Med. Gaz.* 1933. Oct. Vol. 68. No. 10. pp. 545–554. With 10 figs. & 1 coloured plate.

A detailed study of the anaemia of kala azar has led the authors to the conclusion that it is caused by increased erythrolysis which may be the direct result of the general increase in the tissue and blood histiocytes, which is the characteristic reaction to the leishmania infection. A very striking feature of this anaemia is that no attempt to repair deficiency will produce any improvement. This can only be brought about by specific drugs which may act by paralysing the newly formed reticulo-endothelial cells, thus leading not only to their death and that of the contained parasites but to the immediate cessation by

them of the excessive phagocytosis of red cells. Correlated with this was the rapid fall in the reticulocyte count which was continued till only 0·6 per cent. or even less were present, when the patient left the hospital. The many aspects of the case presented are discussed in detail in the paper, which must be read in full by those interested.

C. M. W.

Krishnan (K. V.), Lal (Chiranji) & Napier (L. Everard). **Cytological Studies of the Blood and Tissues in Kala-Azar and Associated Conditions. Part IV. The Large Mononuclear Cells in Monkey Malaria.**—*Indian Med. Gaz.* 1933. Feb. Vol. 68. No. 2. pp. 66–74. With 5 charts & 1 coloured plate.

Napier (L. Everard), Krishnan (K. V.) & Lal (Chiranji). **Cytological Studies of the Blood and Tissues in Kala-Azar and Associated Conditions. Part V. The Large Mononuclear Cells in the Peripheral and in the Spleen Blood in Kala-Azar.**—*Ibid.* No. 2. pp. 75–80. With 1 coloured plate.

A summary of the first paper has appeared in the Malaria Section [*ante*, p. 181].

In the second paper the study has been extended to the blood and tissues in kala azar. The characteristic histological reaction is a marked increase of histiocytes at the various foci of infection, particularly in the spleen. There is also an increase in the number of these cells in the blood of the sinusoids of the spleen. Some of these find their way into the general blood stream while the smallest reach the peripheral circulation. The immediate effect of treatment is to reduce the focal aggregates of these cells which, in want of evidence to the contrary, are assumed to be destroyed *in situ*. At the same time there is an increase of monocytes in the blood and spleen. It appears therefore that the characteristic reaction to leishmania infection is histiocytosis and that a successful immunity response is evidenced by a monocytosis. The increase of monocytes, themselves not actively phagocytic, is associated with a specific humoral reaction. As there is no destruction of leishmania in the histiocytes the increase in the number of these cells is due probably to a non-specific reaction to the presence of foreign bodies in the shape of the parasites. It is suggested that the proliferation of histiocytes which occurs in malaria might tend to scatter through the body localized leishmania infections. It is known that the histiocyte destroys malarial parasites by phagocytosis so that an explanation of the fact that malarial parasites are rarely found in the blood of kala azar cases, though they may appear there after cure of the leishmania infection, may be found in the great increase in these phagocytic cells in kala azar. The monocytosis in kala azar will not in itself check the malarial infection, for a successful immunity requires also a specific humoral substance in addition. *C. M. W.*

Smith (R. O. A.). **Cancrum Oris in a Monkey infected with** *Leishmania donovani*.—*Indian Med. Gaz.* 1933. Aug. Vol. 68. No. 8. p. 455. With 1 fig.

Krishnan (K. V.). **"Vincent's Disease" in a** *Macaca irus* **Monkey.**—*Ibid.* pp. 455–456. With 1 fig.

Four months after the subcutaneous inoculation into the arm of a monkey of *Leishmania donovani* in spleen and liver emulsions of an

infected hamster the animal suddenly developed a swelling of the cheek which next day had broken down exposing the bones. It was killed and was found to have a heavy leishmania infection of the liver and spleen. It appears that cancrum oris has not previously been noted in monkeys. *C. M. W.*

RIVERA (J.). Segunda nota sobre leishmaniosis canina en Madrid. [**Canine Leishmaniasis in Madrid.**]—*Trabajos.* Madrid. 1933. June 15. Vol. 2. No. 15. pp. 39–40.

RIVERA BANDRES (Julio). La leishmaniosis canina en Madrid y sus relaciones con la endemia de kala-azar infantil.—*Medicina Países Cálidos.* Madrid. 1933. Sept. Vol. 6. No. 5. pp. 373–398. With 10 figs. [131 refs.]

These two papers deal with the same subject, namely the search for cases of canine kala azar in Madrid.

It has already been reported by the author [this *Bulletin*, Vol. 30, p. 754] that he had found 11 cases of leishmania infection of dogs in 200 examined. Of these it now appears 8 were cases of visceral infection and 3 of muco-cutaneous infection. It is now reported that a further 250 dogs have been examined yielding 14 visceral and 4 skin cases. In the longer paper, which is a thesis for a doctorate, the whole subject of canine kala azar is discussed in detail with special reference to the conditions maintaining in Madrid. Very little new information regarding the canine disease is, however, contained in it.

C. M. W.

MAYER (M.), LAAS (E.) & SONNENSCHEIN (C.). Ueber generalisierte Infektionen mit *Leishmania tropica* (Orientbeule) bei weissen Mäusen. [**Generalized Infection with *L. tropica* in White Mice.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1934. Jan. Vol. 38. No. 1. pp. 16–28. With 5 figs. [15 refs.]

With cultures of a strain of *Leishmania tropica* of Tunisian origin the authors produced infection in the skin of the tail of mice. Once established in mice the infection was readily sub-inoculated from tail to tail. Up to the 4th passage only local lesions in the tail were produced but at this one of two mice inoculated in the tail as usual developed a generalized infection with numerous parasites in the liver and spleen. After this change in the character of the infection, intraperitoneal inoculation of emulsions of the organs to other mice produced generalized infections associated in many cases with a sero-sanguineous exudate in the peritoneal cavity. Parasites were not seen in the exudate but were present, for a culture was obtained from the fluid. Parasites from the organs inoculated into the skin of the tail produced again a local infection.

A histological examination of the animals with generalized infection showed that the type of infection differed from that seen in kala azar, for there was often a heavy infection of the peritoneum, infected macrophages, either isolated or in groups, occurring throughout the fatty connective tissue. In the liver there occurred numerous nodules composed of masses of infected cells. Similar nodules, though less marked, were found in the spleen, bone marrow, suprarenals, lungs and other organs. *C. M. W.*

Riou (M.) & Advier (M.). Leishmaniose cutanée contractée au Sénégal. [**Dermal Leishmaniasis contracted in Senegal.**]—*Bull. Soc. Path. Exot.* 1933. Feb. 8 & 9. Vol. 26. No. 2. pp. 254–256.

The paper records a case of cutaneous leishmaniasis, in the form of an ulcer on the right wrist, in a man who had lived only in Dakar, Saint-Louis and Joal in Senegal. The disease was without doubt contracted at Joal. Though both Lafont and Heckenroth in 1915 and Marcel Leger in 1922 have recorded canine kala azar in dogs in Dakar, the case recorded is the first of its kind in human beings of this district. *C. M. W.*

Lal (Sangham) & Dogra (J. B.). **Spread of Cutaneous Leishmaniasis along Lymphatics.**—*Indian Med. Gaz.* 1933. Nov. Vol. 68. No. 11. p. 628. With 1 fig.

A sepoy aged 19 contracted oriental sore on the middle finger of the left hand and also on the back of the right thigh. During the course of the disease nodules appeared on the back of the hand and finally along the arm. These followed the course of the lymphatics to which they were connected. Similar nodules appeared round the ulcer on the thigh. The case is recorded as illustrating the mode of spread of the infection. *C. M. W.*

Manai (Andrea). Contributo allo studio delle associazioni morbose. Nota Ia. Sui rapporti tra malaria e leishmaniosi. (**Contribution to the Study of Morbid Associations. On the Relations between Malaria and Leishmaniasis.**)—*Riv. di Malariologia.* 1932. Sept.–Oct. Vol. 11. No. 5. pp. 584–609. English summary (6 lines) p. 750.

A detailed study of three cases of kala azar in Sardinia in persons who gave previous histories of malaria appears to indicate that though the leishmania infection is antagonistic to malaria, it nevertheless tends to be particularly severe in such cases. *C. M. W.*

Pieri (J.) & Lena (D.). Leishmaniose infantile. Sur un cas observé en Corse. [**Case of Infantile K.A. in Corsica.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1933. Dec. 4. 49th Year. 3rd. Ser. No. 30. pp. 1402–1404.

The record of a case of kala azar in a child three years old from Calvi in Corsica. It is also noted that of 16 dogs from Bastia and its environs examined by M. Ch. Joyeux one was found to show leishmania in the spleen and bone marrow. *C. M. W.*

Lörincz (F.) & Szentkirályi (Zs.). Ueber das Vorkommen von *Phlebotomus macedonicus* (Adler und Theodor, 1931) in Ungarn. (Untersuchungen ueber Hunde-Kala-azar.) [**Occurrence of** *P. macedonicus* **in Hungary.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Oct. Vol. 37. No. 10. pp. 458–464. With 7 figs.

The authors record the occurrence in Hungary of the sandfly named in the title. Though it has been suspected to be a vector of kala azar in Greece by Adler & Theodor the authors have not been able to obtain any evidence of the existence of human or canine leishmaniasis in their own country. *C. M. W.*

Jehl (E. P.) & Brissy (G.). Note sur l'existence du bouton d'Orient dans la région de l'Oued Rirh (Sud constantinois). [**Oriental Sore in the Oued Rirh Region.**]—*Arch. Inst. Pasteur d'Algérie.* 1931. June. Vol. 9. No. 2. p. 374.

It has been considered anomalous that oriental sore was absent from the district of Algeria mentioned in the title of the paper though present in neighbouring districts. The discovery of the disease in a boy 12 years of age who had never left the village of Mr'aier has removed this anomaly.

C. M. W.

Costantino (Saverio). Leishmaniosi cutanea e reazioni sierologiche per la sifilide—Loro comportamento. [**Dermal Leishmaniasis and Serological Reactions in Syphilis.**]—*Riv. Sanitaria Siciliana.* 1933. Sept. 15. Vol. 21. No. 18. pp. 1400–1403. English summary (4 lines).

Testing the Wassermann and Meinicke reactions in 9 cases of oriental sore, the author is able to state that the value of these from the point of view of the diagnosis of syphilis is uninfluenced by the other infection.

C. M. W.

THE TYPHUS GROUP OF FEVERS.

ERNSTENE (A. Carlton) & RISEMAN (Joseph E. F.). **Endemic Typhus Fever in Boston. A Report of Ten Cases.**—*New England Jl. of Med.* 1933. Sept. 14. Vol. 209. No. 11. pp. 542–545. With 1 fig. [12 refs.]

Ten cases of endemic typhus fever were observed at the Beth Israel Hospital in Boston in the four years from 1929 to 1932.

The disease corresponded in all essential details with the condition originally described by BRILL. In no instance did it affect more than one individual in a household and all had lived in the United States for many years. Six of the ten cases occurred during the warmer months of the year. A positive Weil-Felix reaction was obtained with the serum of 8 patients. *D. Harvey.*

GRENCI (Emilio). Tifus exantematico. Forma endémica de Córdoba. [**Endemic Typhus in Córdoba.**]—*Prensa Méd. Argentina.* 1933. Nov. 15. Vol. 20. No. 46. pp. 2402–2408. With 2 charts. [14 refs.]

The author describes in clinical detail, with an account of the serological reactions, two cases of typhus, to show that the disease is endemic in Córdoba.

The serum of one gave a positive Weil-Felix reaction in a dilution of 1 in 3,200, the other in 1 in 5,120. The author believes that cases are far from rare. Clinically, the onset was abrupt, the fever lasted for $2\frac{1}{2}$ weeks in one patient, longer in the second because a phlebitis set in, ending in a rapid lysis with speedy recovery of health. At the height of the illness there was stupor with a certain amount of pulmonary congestion and bronchitis and enlargement of liver and spleen. The rat is thought to be the reservoir host and to convey the infection by its fleas.

From a consideration of the subject the author states [we think wisely] that there is no fundamental difference to warrant the regarding of these conditions as new entities, and that the points of dissimilarity may find explanation in differences of race, climate, season, general sanitation, the receptors and transmitters of the virus, "factors which are capable of modifying the virulence and changing the clinical picture without thereby affecting the true specificity" of the infection. *H. H. S.*

ZINSSER (Hans). **Recent Advances in the Study of Typhus Fever.**—*Trans. College of Physicians of Philadelphia.* 1933. 4th Ser. Vol. 1. No. 1. pp. 1–15. [30 refs.]

This very able review of recent advances in the study of typhus fever is made up largely from papers that have already been published and summarized in this *Bulletin*.

The author is convinced that the Mooser bodies in the tunica of infected guineapigs are true Rickettsia and very closely allied although not identical with *Rickettsia prowazeki*. Nine facts are cited on which this opinion is based and one of these is new and has not so far been published.

Employing the method used by GOODPASTURE for the cultivation of filterable viruses on the living embryonic membranes of fertilized hens' eggs, the author obtained typical intracellular Rickettsiae in eggs inoculated with Mexican virus tunica material and in eggs

inoculated with spleen from a European typhus guineapig. In position, staining and morphology the observed organisms were identical. Guineapig inoculation from parts of these egg membranes in each case gave rise to the disease which had furnished the egg inoculum ; in the one case fever only with abundant typhus lesions in the brain, in the other fever and scrotal reaction and scanty lesions in the brain.

It is also of interest to note that in smears from the piece of spleen utilized for the inoculum no Rickettsia could be seen, yet these rapidly developed in the cells of the egg membrane after inoculation. *D. H.*

Afanassiewa (A.) & Tretjak. Ueber Flecktyphusvirusträger. [**Typhus Carriers.**]—*Zent. f. Bakt.* I. Abt. Orig. 1933. Nov. 1. Vol. 130. No. 1/2. pp. 123–128. With 7 figs. [Summary appears also in *Bulletin of Hygiene.*]

In an attempt to estimate the frequency of symptomless typhus among children, the authors have carried out repeated agglutination tests on the inmates of two homes, each housing 65 children aged between nine and sixteen years. Their results, they think, indicate that symptomless infections and virus-carriers are frequent among children in an infected community.

In one home a few cases of typhus fever occurred during the investigation, in the other none. The culture employed for the tests was a strain of *Proteus X19*. The authors note that, in the three cases of clinical typhus examined, H agglutination was obtained to high titre, while in the apparently healthy children, with whom this report is mainly concerned, the agglutination was always of the O type.

Among the children in the home in which typhus infection existed, 17 gave negative Weil-Felix reactions throughout, 7 children gave agglutination at low dilutions (1 : 50 to 1 : 100) but showed no rise in titre, 16 children gave, on first examination, agglutination at a serum dilution of 1 : 50 to 1 : 400 and showed a marked rise in titre during the following ten to fourteen days, 22 children showed an initial low titre (1 : 50) rising to 1 : 800 or thereabouts during the following one to one-and-a-half months. The authors regard the two first groups as uninfected, the third as suffering from an ephemeral typhus infection, and the fourth as comprising cases of symptomless infection, or virus carrying.

Among the 65 children in the home in which no clinical case of typhus occurred, 50 gave entirely negative reactions, and 15 gave agglutination at low serum dilutions with no subsequent rise in titre.

Blood was obtained from eight of the children in the fourth group in the infected home, and with these samples sixteen guineapigs were infected. Fourteen showed the characteristic febrile reaction of experimental typhus ; in the remaining two the reaction was doubtful.

W. W. C. Topley.

Kuteischikow (A.), Dosser (E. M.) & Bernhoff (F. G.). Der experimentelle symptomlose Flecktyphus beim gesunden und unempfänglichen Menschen. [**Inapparent Typhus in Healthy Insusceptible People.**]—*Zent. f. Bakt.* I. Abt. Orig. 1933. Aug. 15. Vol. 129. No. 3/4. pp. 262–265.

These three observers in Moscow had all suffered from typhus in the big epidemic of 1920–21. In 1930 they tested their sera and

found that the Weil-Felix reaction was negative in a dilution of 1/20.

Lice taken from a typical case of typhus fever were allowed to feed on all three observers on 23/2/30 and daily for one week ; some of the lice were killed and examined and numerous Rickettsia were found in the cells lining the intestine. Four days after the first feed the Weil-Felix reaction became positive in a dilution of 1/30 and 1/50 ; on the 13th day in the case of Dr. Dosser the reaction was positive in a dilution of 1/200. Blood was taken from a vein on this day and injected into two guineapigs ; both reacted with fever after an incubation period of 8 days and the virus was passaged in a series of animals ; typical typhus lesions were demonstrated in the brains of those killed for examination.

None of the three experimenters showed any symptoms of illness. The authors are of opinion that such virus carriers as Dr. Dosser (inapparent infection in partially immune persons) may account for the carrying over of the virus during the inter-epidemic periods. Normal lice fed on observers did not cause any rise in the Weil-Felix reaction. *D. H.*

Kleeberg (J.). **The First Case of " Exanthematic Fever " observed in Palestine.**—*Folia Medicinae Internae Orientalia.* Jerusalem. 1933. May. Vol. 1. No. 2. pp. 235–236.

A mild case of fever with profuse macular rash on the trunk but not on the face. The Widal reaction was negative as was the Weil-Felix reaction ; no tache noire was noted. *D. H.*

Lépine (P.). Recherches sur le typhus exanthématique et sur son origine murine. Premier mémoire : Sur l'existence d'un typhus murin dans le bassin oriental de la Méditerranée et sur les caractères de ce virus. [**Rat Typhus in the Eastern Basin of the Mediterranean : Characters of the Virus.**]—*Ann. Inst. Pasteur.* 1933. Sept. Vol. 51. No. 3. pp. 290–376. With 16 text figs. [80 refs.]

This comprehensive review of the subject of rat typhus virus comprises the substance of a number of papers by Professor Lépine which have already been published and summarized in this *Bulletin.*

Conclusions.—1. A virus which can be passaged in guineapigs is found with great frequence in the brains of wild rats in the Eastern Mediterranean area. The natural disease in the wild rats waxes and wanes and is mild in the black rat.

2. The rat virus of Athens presents characters analogous to the typhus virus both *in vitro* and *in vivo.*

3. The rat virus is easily and rapidly destroyed by heat by drying and by antiseptics, and remains alive only a short time in glycerine ; on the other hand it is resistant to cold ; it passes a Chamberland L2 filter but is held back by Chamberland L3.

4. Guineapigs inoculated with this virus develop fever and later a scrotal reaction similar to that produced by Mexican typhus virus. Rickettsia can be demonstrated in smears from the tunica.

5. Rats inoculated with the virus develop a severe fever often fatal, in contrast to the inapparent infection produced by the virus of epidemic typhus.

6. Sometimes passage through guineapigs causes the loss of these characteristic features and it may be difficult to distinguish between the rat virus and typhus virus (epidemic).

7. Monkeys inoculated with the rat virus develop a severe fever and a positive Weil-Felix reaction appears in the blood serum.
8. The spermophile of Macedonia is susceptible to the rat virus and to typhus virus but does not show the scrotal reaction.
9. Mice and rabbits are also susceptible.
10. The virus persists in the brain of rats and mice for considerable periods after the fever has ceased. *D. H.*

Nicolle (Charles) & Giroud (Paul). L'existence du typhus murin chez les rats de la région parisienne est encore à démontrer. [**Typhus Virus in Parisian Rats not yet Demonstrated.**]—*Bull. Acad. Méd.* 1933. Dec. 19. 97th Year. 3rd Ser. Vol. 110. No. 41. pp. 737–738.

The authors do not consider that Professor Brumpt [see this *Bulletin*, Vol. 29, p. 773] has definitely proved that the rat typhus virus is present in the rats of Paris since in his investigation the virus was not passaged in guineapigs, Rickettsia bodies were not demonstrated in smears from the tunica of any of the animals, nor were they tested for immunity to typhus virus. Of 156 rats caught in various districts of Paris and the suburbs brain emulsion was injected by the authors intraperitoneally into 64 guineapigs ; 35 of these showed no reactions but 29 had fever and some died, and several developed orchitis ; subinoculation of the brains of these animals into other guineapigs gave no results. Eighteen of the original guineapigs which had been injected with the brains of the rats and *had not* reacted were tested by injection of a Mexican rat typhus virus ; all reacted. *D. H.*

Brumpt (E.). Le typhus des surmulots de Paris. [**Rat Typhus in Paris.**]—*Bull. Acad. Méd.* 1933. Dec. 26. 97th Year. 3rd Ser. Vol. 110. No. 42. pp. 754–761. With 1 fig.

Professor Brumpt replies to the criticisms of his work on rat typhus in Paris (above), and points out that although he did not find Rickettsia in smears from the tissues of the inoculated guineapigs he did test for immunity to a strain of human typhus supplied to him by Weigl from Poland.

At the same time on reviewing his own work Brumpt is inclined to the view that he may have been dealing not only with rat typhus virus but also with the virus of rat bite fever since several of the inoculated guineapigs showed atrophy of the testicles and definite glandular enlargement. But in one instance at least a guineapig reacted to the injection of an emulsion of the brains of the wild rats with fever only (no scrotal reaction) and was later shown to be immune to the human typhus virus. *D. H.*

Sparrow (Hélène). Un an d'entretien d'un virus typhique murin d'origine mexicaine dans un laboratoire d'Europe. [**A Year's Maintenance of a Mexican Murine Typhus Virus in Europe.**]—*Arch. Inst. Pasteur de Tunis.* 1933. July. Vol. 22. No. 1. pp. 13–20.

The two strains of virus under investigation were :—

1. Human typhus virus, European.
2. Rat typhus virus, Mexican.

The virus was kept going by three methods : (*a*) Passage from guinea-pig to guineapig by injection of emulsion of brain.

(*b*) Passage by tunica exudate.

(*c*) Passage from rat to rat sometimes by brain and sometimes by exudate.

Results—Mexican rat virus : (*a*) 49 passages in one year. 114 animals used ; fever in 92 per cent., scrotal reaction in 50 per cent.

(*b*) 44 animals ; scrotal reaction in 37.

(*c*) 60 passages ; 145 rats ; 133 showed fever, 27 died of fever.

European virus (human) : 42 passages ; 110 guineapigs used ; 11 no fever, no deaths. 32 were males ; 2 showed marked scrotal reaction. *D. H.*

Kritschewski (I. L.) & Rubinstein (P. L.). Das Fleckfieber bei den wilden Ratten in Moskau. I. Mitteilung. [**Typhus in Wild Rats in Moscow.**]—*Zent. f. Bakt.* I. Abt. Orig. 1933. Oct. 6. Vol. 129. No. 7/8. pp. 493–501. With 10 figs. [12 refs.]

The authors review work already done on the same lines in America and Europe.

Of rats captured in the city of Moscow 9 were killed and the brains emulsified and inoculated into 3 guineapigs. Two of these reacted with fever and swelling of the scrotum. The virus was then passed in series in guineapigs. Temperature curves are given and also three microphotographs showing Rickettsia bodies in the cells in smears from the tunica of infected guineapigs. This strain of rat typhus virus was then compared with a strain of true louse-carried typhus isolated from a human case. Distinct differences in the reactions in guineapigs and in rats were noted and guineapigs which had reacted to the human virus subsequently reacted when inoculated with the rat virus. A possible fallacy in this observation is that the test dose was given before the end of the fever due to the initial reaction so that there was a recrudescence of fever rather than a second reaction. However, the authors have shown that in Moscow there are two typhus viruses, one the human louse-borne type and the other the rat virus. *D. H.*

Pijper (Adrianus) & Dau (Helen). **A Preliminary Note on a Typhus-like Virus in South African Rats.**—*South African Med. Jl.* 1933. Nov. 11. Vol. 7. No. 21. pp. 715–716. With 1 fig. [23 refs.]

Eighteen rats were captured in Potchefstroom where cases of a typhus-like disease have been reported. Their brains were emulsified and injected intraperitoneally into six guineapigs. All showed fever typical of a typhus-like infection and the post-mortem changes, enlarged spleen, adrenals and testicles, with marked injection of the brain, confirmed this. Emulsion of the brain of a second passage guineapig was injected into four guineapigs. Two of them were normal clean animals, one had recovered from fever following inoculation with tick bite fever virus and one from fever caused by typhus virus ; the first three reacted to the rat virus, the 4th showed no reaction. These rats then harboured a typhus-like virus differing from tick bite virus and closely related to the virus of South African typhus.

D. H.

VAN MEIRHAEGHE (A.). Recherche du virus du typhus exanthématique murin chez des rats provenant de Gand et du port d'Anvers. [**Murine Typhus Virus sought in Rats from Ghent and Antwerp.**]—*Rev. Belge Sci. Méd.* 1933. Nov. Vol. 5. No. 9. pp. 653–657.

Eighty-eight rats were caught and killed in Ghent and Antwerp and the brains emulsified and inoculated into guineapigs ; 17 of these brains produced fever in the guineapigs. As the injections were subcutaneous it is not surprising that there was no scrotal reaction in any of the guineapigs and the incubation period in some cases was very prolonged. Details are given in a table. *D. H.*

COMBIESCO (D.) & POPESCO (C.). Absence du typhus exanthématique murin en Roumanie. [**Murine Typhus Absent from Rumania.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 30. pp. 317–318.

One hundred rats were captured in Bucharest and in Constantza, the brains emulsified and inoculated into guineapigs, none of which reacted. [It would be necessary to examine a great many more rats before it could be said that the typhus rat virus was not to be found in Rumania.] *D. H.*

TAKAHASHI (K.) & KODAMA (M.). **A Few Supplements to the Study on Infection and Immunity in "Manchurian Fever" and "Typhus" of Rats.**—*Kitasato Arch. Experim. Med.* 1933. Oct. Vol. 10. No. 4. pp. 259–266.

Endemic and epidemic typhus virus were inoculated into rats at Dairen ; at intervals of 3 days 0·5 cc. of blood was drawn off and inoculated into male guineapigs ; the epidemic typhus virus was recovered up to the 17th day, the endemic virus up to the 32nd day.

Rats reinoculated with the endemic virus after one month showed evidence of reinfection, *i.e.*, fever, but no recrudescence of the scrotal reaction. Also rats which had recovered from the fever due to inoculation with true typhus virus showed evidence of infection when later inoculated with the endemic virus. If reinoculated while the blood was still infective no superinfection occurred. The authors consider that the typhus fever of rats is a latent infection producing only a very slight immunity so that the host can be infected many times over ; thus the rat becomes a persistent carrier of the virus. *D. H.*

NAGAYO (Mataro), HAZATO (Hikozaemon), MITAMURA (Tokushiro) & TAMIYA (Takeo). Ueber den Erreger des Flecktyphus. Sein Wachstum in der Gewebekultur und seine Morphologie. [**Typhus Virus, its Multiplication in Tissue Culture and its Morphology.**]—*Trans. Japanese Path. Soc.* 1932. Vol. 22. pp. 723–727. With 1 coloured fig.

A similar method to that employed by the authors for the tissue culture of the virus of tsutsugamushi fever [see this *Bulletin*, Vol. 29, p. 784] was used to cultivate the virus of typhus fever. The tissue employed was the cells of Descemet's membrane of the eye of rabbits and the medium was rabbit plasma incubated at 37°C. Typical

Rickettsia were observed in the cells after 5 to 7 days' culture. No difference could be made out between the organisms of Manchurian and epidemic typhus but they differ from *R. orientalis*. *D. H.*

Hoshizaki (Sôyô). **Studies of the Virus of Manchurian Typhus and Typhus Fever in Tissue Culture.**—*Trans. Japanese Path. Soc.* 1932. Vol. 22. pp. 712–723.

The method employed in this research was a combination of two methods of tissue culture already described. In the first instance small pieces of infected tissue (parietal layer of tunica of guineapig) were placed in blood plasma + homologous testicular effusion medium and inoculated at 30°C.; after ten days small pieces of similar but normal tissue were added to the culture and so on alternately.

One strain of Manchurian typhus and 3 strains of epidemic typhus were utilized. It was found possible with the Manchurian virus to cultivate Rickettsia successfully for 11 generations over a period of 88 days and at the end of that time the virulence of the culture had increased 100 fold. The epidemic typhus virus was passed through 7 generations over a period of 52 days. No striking morphological differences could be made out between the organisms in culture, "they are essentially identical" but two interesting points were noted:—

1. After cultivation the typhus virus produced fever and testicular swelling in the guineapig, a similar reaction to that produced by the Manchurian virus.

2. Rickettsia could only be demonstrated in about 30 per cent. of the cultures; yet those cultures which were negative for Rickettsia were just as virulent as the cultures in which Rickettsia were numerous.

To the authors this suggests a filterable stage of the parasite since Rickettsia could again be demonstrated in animals infected with those cultures.

[See also this *Bulletin*, Vol. 29, p. 781.] *D. H.*

Serebrennaja (A. I.), Grünfeld (A. A.) & Neumann (M. W.). Experimentelle Studien ueber das Flecktyphusvirus. II. Mitteilung: Experimenteller Flecktyphus bei Zieseln. [**Experimental Typhus in Susliks.**]—*Zent. f. Bakt.* I. Abt. Orig. 1933. Aug. 15. Vol. 129. No. 3/4. pp. 254–262. With 5 figs.

The authors working in Odessa found it difficult to obtain monkeys or guineapigs for experimental work on typhus and therefore utilized as test animals the local suslik, which they find suitable for such research, for 85 per cent. of the animals inoculated developed fever. The incubation period is only 4 days as compared with 8 days in guineapigs and a positive report can be more quickly obtained. The temperature curve in these small animals when infected with typhus virus is characteristic. *D. H.*

Blanc (Georges), Noury (M.) & Baltazard (M.). Réaction de Neill-Mooser et typhus murin. [**Neill-Mooser Reaction and Rat Typhus.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 31. pp. 439–441.

There are at least three viruses which may produce a scrotal reaction in male guineapigs—Rocky Mountain fever, boutonneuse fever and

endemic typhus fever (rat typhus virus). These diseases are apparently immunologically distinct; is there then a virus which produces a scrotal reaction in guineapigs and is associated with each of these distinct varieties of virus?

The authors attempted to infect man with the emulsion from the scrotum of a guineapig which had been inoculated with the virus of boutonneuse fever but did not succeed. But the emulsion from the scrotum of guineapigs which had been inoculated with the rat typhus virus produced a mild but definite attack of typhus in two men who were experimentally inoculated. A slight rise was noted in the Weil-Felix reaction, 1/125. In view of this result the authors consider that the Neill-Mooser reaction is specific and is due to the virus of rat typhus. *D. H.*

Weigl (Rudolf) & Hertzig (A.). Les corps de Mooser et les rickettsia des poux dans le typhus exanthématique mexicain. [**Mooser Bodies and Lice Rickettsia in Mexican Typhus.**]—*Arch. Inst. Pasteur de Tunis.* 1933. Nov. Vol. 22. No. 3. pp. 321–324.

The authors repeating Mooser's work inoculated lice *per anum* with the washings from the infected testicle of a guineapig, the lice became infected and Rickettsia were observed multiplying rapidly in the cells lining the intestine. The lice die of the infection from the 3rd to the 7th day.

The appearance is exactly the same when *Rickettsia prowazeki* is inoculated into the lice. The bodies or Rickettsia which appear in the louse cells are agglutinable by the serum of animals infected with Mexican typhus virus. The absorption test also confirmed the identity of the Mooser bodies with Rickettsia.

Conclusions:—The microscopical examinations of lice inoculated with Mooser bodies as well as a study of the serological properties of the bodies confirm the opinion that the Mooser bodies are Rickettsia.

D. H.

Nicolle (Charles). Corps de Mooser et cellules de Mooser. [**Mooser Bodies and Mooser Cells.**]—*Arch. Inst. Pasteur de Tunis.* 1933. Nov. Vol. 22. No. 3. p. 325.

Nicolle agrees with Weigl that the Rickettsia described in the cells of the tunica of infected guineapigs in rat typhus should be called *R. mooseri* but considers that the endothelial cells filled with these Rickettsia and first described by Mooser should be called "cells of Mooser." *D. H.*

Nicolle (Charles), Laigret (J.) & Giroud (P.). Passage des virus exanthématiques par voie digestive chez le rat. Importance de cette voie dans la transmission naturelle des typhus murins. [**Passage of the Typhus Viruses through the Digestive Tract in the Rat. Importance of this Route in the Natural Transmission of Rat Typhus.**]—*Arch. Inst. Pasteur de Tunis.* 1933. Nov. Vol. 22. No. 3. pp. 326–337.

Guineapigs were inoculated with the different viruses and were killed during the fever and the brains fed to rats. The rats showed no fever but guineapigs inoculated from the rats developed a mild form of fever and were proved later to be immune to the virus. Fleas were fed on infected guineapigs and, later, rats ingested the emulsion

of these fleas ; they became infected as evidenced by guineapigs used as indicators.

It was not found possible to infect rats by the bite of infected fleas and the authors are of opinion that rats become infected in nature, either by eating infected fleas or by eating the bodies of other rats which were already infected. *D. H.*

Sparrow (Hélène). Transmission du typhus murin du Mexique par les puces de rat à rat. [**Transmission of Murine Typhus of Mexico from Rat to Rat by Fleas.**]—*Arch. Inst. Pasteur de Tunis.* 1933. July. Vol. 22. No. 1. pp. 10–12.

Four normal rats were placed in a cage with a rat which had been infected with Mexican typhus virus and killed during the fever. Although none of the rats showed any fever yet all gave a positive Weil-Felix reaction. In another experiment two normal rats were placed in a cage with a living infected animal ; both later gave positive Weil-Felix reactions and both proved immune to injection of the rat typhus virus. *D. H.*

Zinsser (Hans) & Castaneda (M. Ruiz). **On the Isolation from a Case of Brill's Disease of a Typhus Strain resembling the European Type.**—*New England Jl. of Med.* 1933. Oct. 26. Vol. 209. No. 17. pp. 815–819. With 3 charts. [14 refs.]

A severe case with marked coma but only slight rash—death on the 12th day of disease—Weil-Felix reaction negative.

On the 10th day of the disease blood was taken from the patient and inoculated into two guineapigs. Both reacted with typical fever but there was no scrotal reaction ; and although the strain has been passed through a series of guineapigs only in one instance has the scrotal reaction been noted and that slight and transient. As the authors point out, this fact demonstrated the existence in the larger cities of the north-eastern sea board of the United States of an endemic variety of typhus the virus of which in early animal passages is indistinguishable from that of the classical continental European type. Animals recovered from the fever produced by the Boston strain were found to be immune to both the Mexican and European virus and vice versa. Also guineapigs which were killed during the fever caused by the Boston virus showed the typical typhus lesions in the brain. *D. H.*

Combiesco (D.), Popesco (C.), Stamatesco (S.) & Angelesco (J.). Sur la perméabilité placentaire au virus du typhus exanthématique. [**Permeability of Placenta to Virus of Typhus.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 30. pp. 316–317.

Two pregnant guineapigs suffering from typhus fever were killed and the foetuses removed from the uterus ; emulsion of the brains was inoculated into normal guineapigs and produced typhus fever proving that the placenta is pervious to the virus. *D. H.*

Panayotatou (A.). Expériences sur la filtrabilité du virus du typhus exanthématique. [**Filterability of Typhus Virus.**]—*Bull. Soc. Path. Exot.* 1933. Nov. 8. Vol. 26. No. 9. pp. 1138–1140.

A guineapig was inoculated with the fluid of 17 ground up fleas (*X. cheopis*). It developed fever on the 5th day with marked scrotal

swelling, and on the 12th day examination of smears from the tunica showed very numerous Rickettsia, both free and in the endothelial cells; a few Rickettsia were also seen in peritoneal smears. The fluid from the tunica and the peritoneum was filtered through an L3 candle and the filtrate injected into a guineapig; this animal became infected. The virus was passaged in a similar manner 5 times but it was noted that after the 3rd passage the incubation period was prolonged, the fever was not so marked and there was little or no swelling of the scrotum. *D. H.*

Laigret (Jean) & Durand (Roger). Sur la conservation des virus exanthématiques *in vitro*. [**Preservation of Typhus Viruses in Vitro.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 35. pp. 897–898.

The authors recommend that portions of the organs or the blood of infected animals be placed in tubes of glycerine in the refrigerator at a temperature of −12° to −15°C. By this means they found that the typhus virus was still active up to 20 days and the virus of Rocky Mountain fever up to 35 days. *D. H.*

Nicolle (Charles) & Laigret (J.). Recherches sur un virus typhique murin, isolé à Anvers de rats d'un bateau en provenance de l'Afrique du Nord. Immunités croisées avec d'autres virus exanthématiques. [**Researches with a Rat Typhus Virus isolated from Rats on a Ship at Antwerp from North Africa. Crossed Immunity Tests with other Typhus Viruses.**]—*Arch. Inst. Pasteur de Tunis.* 1933. Nov. Vol. 22. No. 3. pp. 338–345.

The viruses employed in these tests were (1) a typhus virus isolated in 1924 in Tunis from a patient and maintained in the laboratory since that date. (2) A rat typhus virus from Mexico. (3) A rat typhus virus from Toulon. (4) A Rocky Mountain fever virus.

Conclusions:—There was definite crossed immunity between the Antwerp virus and the three other typhus viruses from Tunis, Mexico and Toulon. But the results of the tests against the Rocky Mountain fever virus were different. In 4 tests in which the inoculation of the fever virus preceded the Antwerp virus, one definite infection resulted, two light infections and one negative result. In 5 tests when the inoculation of the Antwerp virus preceded the fever virus, one definite infection resulted, three light infections and one negative result. All controls showed severe infections and most died. It would appear then that the Antwerp rat typhus virus approaches antigenically more nearly to the Rocky Mountain fever virus than any rat typhus virus yet studied. *D. H.*

Mooser (H.) & Sparrow (H.). Immunisations croisées entre un virus du typhus historique (souche tunisienne) et des virus du typhus d'origine mexicaine (souche murine et souche humaine). [**Cross Immunization between Historic Typhus Virus (Tunis) and Virus of Mexican Origin Murine and Human.**]—*Arch. Inst. Pasteur de Tunis.* 1933. July. Vol. 22. No. 1. pp. 1–9.

These cross immunity experiments were carried out in Mexico when Professor Nicolle was on a visit to that country. Twenty-three guineapigs recovered from fever due to Mexican virus gave no

reaction when inoculated with the European virus and the European virus also protected against the Mexican.

Passive immunity tests with the serum of convalescents from European typhus showed evidence of protective power against both viruses but the serum of convalescents from Mexican fever showed protective power against itself only.

Weigl vaccine prepared from lice infected with the European virus gave complete protection in guineapigs against this virus but did not protect to the same degree against the Mexican virus. Zinsser vaccine prepared with the Mexican virus did not give any protective power against the European virus. *D. H.*

Sparrow (Hélène). L'épreuve de l'immunisation croisée entre deux virus typhiques virus historique européen et virus murin mexicain. [**Cross Immunization between European Typhus Virus and Mexican Typhus Virus in Rats.**]—*Arch. Inst. Pasteur de Tunis.* 1933. July. Vol. 22. No. 1. pp. 21–35.

The inoculation of the Mexican virus immunized 80 per cent. of the guineapigs against the European virus. The inoculation of the European virus protected 91 per cent. of guineapigs against the Mexican virus. *D. H.*

Nicolle (Charles) & Laigret (J.). L'épreuve des immunités croisées entre les virus typhiques et le virus de la fièvre pourprée des Montagnes Rocheuses. Quelques faits d'extension du pouvoir immunisant de ces virus. [**Cross Immunity between Typhus Virus and Virus of Rocky Mountain Fever.**]—*Arch. Inst. Pasteur de Tunis.* 1933. July. Vol. 22. No. 1. pp. 36–46.

Twenty-five guineapigs which had reacted to typhus virus (13 European virus and 12 Mexican virus) were inoculated with the virus of Rocky Mountain spotted fever; all reacted with one exception. There was no immunity, yet the mortality in these animals was considerably less than among the controls.

Two monkeys which had been inoculated on three occasions with different typhus viruses did *not* react when subsequently inoculated with the virus of Rocky Mountain fever. Apparently, as Lépine has suggested, the repeated injection of typhus virus not only protects against such virus but also against a distinct virus of the same group, in this instance the virus of spotted fever. *D. H.*

Jelin (W.) & Fränkmann (E.). Ueber die Behandlung von Fleck-typhus mit Rekonvaleszentenserum. [**Treatment of Typhus by Convalescent Serum.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1933. Dec. Vol. 37. No. 12. pp. 528–535. With 6 figs. [13 refs.]

Convalescent serum has undoubtedly a curative effect on typhus fever in guineapigs. The serum was drawn off from patients 10 days after the fever had ceased. The effect was more marked when the serum was given early and in large doses, for instance 24 to 48 hours after the injection of the infective material into the guineapigs.

In treated animals which showed no fever the typical lesions could be found in the brain on post mortem examination; a latent infection. The action of the convalescent serum is specific; normal human serum had little or no effect but curiously enough normal sheep

serum had some. It is proposed to follow this up since the great drawback to the use of convalescent serum is the difficulty of obtaining it in sufficient quantity. *D. H.*

Blanc (Georges), Noury (M.), Baltazard (M.) & Barnéoud (J.). Essais de vaccination humaine contre le typhus exanthématique avec un vaccin vivant. [**Attempts to vaccinate Man against Typhus with a Living Vaccine.**]—*Bull. Acad. Méd.* 1933. Oct. 31. 97th Year. 3rd Ser. Vol. 110. No. 34. pp. 274–282. With 6 charts.

The virus utilized in these experiments was a rat typhus virus of low virulence isolated in Casablanca which had been shown to produce only a mild fever without any general symptoms in man or animals. Several volunteers were inoculated with this virus and a mild reaction resulted. When later reinoculated with a dose of the same virus there was no reaction at all and only slight fever when they were tested with a Toulon rat virus. By treating the T.M.C. virus* with ox bile it was still further attenuated although still active, producing slight febrile reaction in man and these men later were shown to be immune to injections of the Toulon rat typhus and a virus of epidemic (H) typhus virus. Lice fed on these protected people did not become infected either after the immunizing dose or the test dose ; i.e., they did not become carriers of the germ.

D. H.

Weigl (Rudolf). Faits d'observation et expériences démontrant l'efficacité du vaccin à rickettsia pour la prévention du typhus. [**Observations and Experiments demonstrating the Efficacy of Rickettsia Vaccine in Prevention of Typhus.**]—*Arch. Inst. Pasteur de Tunis.* 1933. Nov. Vol. 22. No. 3. pp. 315–320. [Summary appears also in *Bulletin of Hygiene.*]

This vaccine is prepared by emulsifying in carbolized saline the intestines of lice which have been infected *per anum*. The vaccine has been largely used in Poland, some 6,000 persons having been inoculated. Of those who had received three doses of the vaccine (2,755) none developed typhus although all were exposed to infection—doctors, nurses and orderlies in charge of disinfection of clothing of typhus patients. Missionaries in China have also been successfully protected by this vaccine.

Nicolle inoculated a child with 3 doses of vaccine, then gave a test dose of infected material ; the child proved immune ; guineapigs inoculated with the test material became infected. A laboratory worker was inoculated with the vaccine and numerous infected lice were fed on her without any reaction whereas three others not protected all developed typhus. Another worker inoculated during the incubation period developed fever but lice fed on him did not become infected. Inoculated people who do develop the disease have a mild attack and are no danger to others since the virus is not present in the peripheral blood. *D. H.*

* Typhus murin Casablanca.

Chrzanowski (B.) & Mosing (H.). Sur l'emploi des rickettsia des crottes de poux pour la vaccination contre le typhus exanthématique. [**The Use of the Rickettsia in the Excreta of Lice for Vaccination against Typhus.**]—*Arch. Inst. Pasteur de Tunis.* 1933. Nov. Vol. 22. No. 3. pp. 346–349.

The authors have found that Rickettsia remain in the excreta of lice for very long periods, several years. At first inoculation of the excreta produced severe reactions.

The method now employed is to emulsify the excreta in phenol saline 0·5 per cent.; a thick emulsion results which is centrifuged lightly and the supernatant fluid containing the Rickettsia pipetted off; this is then centrifuged again at a high speed, the Rickettsia are thrown down and the fluid removed; the sediment is then washed several times until a suspension of pure Rickettsia is obtained. This vaccine has been tested on some 250 guineapigs and compared with Weigl's original vaccine. It produces just as good immunity as the intestinal vaccine of Weigl. The amount of vaccine prepared from the excreta of 2 lice during 3 days has been found sufficient to immunize a guineapig. No local reaction was noted in any of the guineapigs nor in any of the men inoculated. Vaccines prepared from excreta 2 years old were as potent as those prepared from fresh excreta. The serum of inoculated guineapigs contained agglutinins for the Rickettsia. The employment of this vaccine would effect large economies in time and personnel. *D. H.*

Brumpt (E.) Transmission de la fièvre pourprée des Montagnes Rocheuses par la tique américaine *Amblyomma cayennense*. [**Transmission of Rocky Mountain Fever by** *A. cayennense*.]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 31. pp. 416–419.

The author collected female *Amblyomma cajennense* ticks in Mexico and bred from them in Paris. They were found to transmit Rocky Mountain fever. Nymphs of these ticks were fed on guineapigs infected with the virus of Rocky Mountain fever by Dermacentor ticks. The adults from these nymphs which developed were fed on normal guineapigs and these had typical attacks of Rocky Mountain fever.

It would appear to be established that Rocky Mountain fever of the United States and Sao Paulo typhus are identical as they protect the one against the other and can be carried by a common vector. [See this *Bulletin*, Vol. 30, pp. 893–4.] *D. H.*

Davis (Gordon E.) & Parker (R. R.). **Additional Studies on the Relationship of the Viruses of Rocky Mountain Spotted Fever and Sao Paulo Exanthematic Typhus.**—*Public Health Rep.* 1933. Aug. 18. Vol. 48. No. 33. pp. 1006–1011. With 3 charts.

Guineapigs which have received Rocky Mountain spotted fever vaccine are protected in equal degree against spotted fever virus and Sao Paulo virus. Guineapigs which have recovered from Sao Paulo disease are completely resistant to spotted fever virus. Monkeys which have recovered from spotted fever virus are completely resistant to Sao Paulo virus.

These results are additional evidence of the essential identity of the two viruses. *D. H.*

Monteiro (J. Lemos). O "typho exanthematico de S. Paulo" e suas relações com a febre maculosa das montanhas rochosas, a luz das provas de immunidade cruzada. [**Relationship of Sao Paulo Typhus and Rocky Mountain Spotted Fever in light of Crossed Immunity Tests.**]—*Brasil-Medico.* 1933. June 24. Vol. 47. No. 25. pp. 437–442. [10 refs.] English summary.

———. Résultat de l'épreuve d'immunité croisée entre le typhus exanthématique de Sao Paulo et la fièvre pourprée des Montagnes Rocheuses. [**Crossed Immunity Test between S. Paulo Typhus and Rocky Mountain Fever.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 30. pp. 374–376.

A comparative study made in Brazil between the virus of Rocky Mountain fever and the virus of the Sao Paulo typhus fever.

(1) Guineapigs that had reacted to the virus of Sao Paulo typhus were found to be immune to the virus of Rocky Mountain fever. (2) Guineapigs which had been immunized against the Sao Paulo virus by means of a vaccine prepared from infected Amblyomma ticks were also found to be immune to Rocky Mountain fever virus. Dyer has already shown that the reverse is true, that is, animals immunized to Rocky Mountain fever are immune to Sao Paulo virus.

Conclusion :—The Sao Paulo typhus belongs to the group of typhus-like fevers and represents a variety of Rocky Mountain fever.

D. H.

Boncinelli (Umberto). Forme inapparenti della febbre esantematica mediterranea. [**Inapparent Forms of Mediterranean Typhus.**]—*Sperimentale.* 1933. Vol. 87. No. 3–4. pp. 337–341. English summary (8 lines).

In September three cases of fever occurred at the Technical Police School in Rome. All three patients were in charge of police dogs many of which were heavily infested with ticks, *R. sanguineus*. The sera of those attacked gave a positive Weil-Felix reaction one on the 14th, one on the 17th day of disease in a titre of 1 in 320 ; the third was negative until convalescence (25th day) when he reacted positively in 1 in 640. The author then tested the blood of 19 other officers of the school who had been in contact with those previously attacked and in the same environmental conditions but who had had no clinical symptoms of infection. Two gave a positive reaction in 1 in 160 indicative of inapparent infection ; two others reacted in a low dilution of 1 in 40. *H. H. S.*

Petzetakis & Karalis. Fièvre boutonneuse et séroréaction de Weil-Felix. [**Boutonneuse Fever and the Weil-Felix Reaction.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 31. pp. 470–471.

Boutonneuse fever has been recognized in Greece ; of 7 cases investigated 3 gave a positive Weil-Felix reaction of 1/500 or over.

D. H.

van Slype (W.). Un cas probable de fièvre boutonneuse. [**A Probable Case of Boutonneuse Fever.**]—*Ann. Soc. Belge de Méd. Trop.* 1933. Oct. 30. Vol. 13. No. 3. pp. 373–378.

A case of fever with maculo-papular eruption in a young European who had been 8 years in the Congo.

A primary sore or typical " tache noire " was noted in the neighbourhood of the scrotum with local adenitis and lymphangitis. There was no history of tick bite and the Weil-Felix reaction could not be tested.

D. H.

Eschbach (H.). Fièvre exanthématique méditerranéenne. [**Mediterranean Typhus.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1933. Dec. 4. 49th Year. 3rd Ser. No. 30. pp. 1406–1407.

A case of Marseilles (boutonneuse) fever in a neighbourhood in France where the disease had never previously been reported. This case was contracted in Avignon and imported into Berny. A typical " tache noire " was noted but the Weil-Felix reaction was negative. *D. H.*

Kimura (Ren), Misugi (Yoshitoshi), Hirai (Teizô) & Miyazawa (Yoshitaka). Untersuchungen ueber den Erreger der Tsutsugamushikrankheit in den Gewebskulturen. [**The Virus of Tsutsugamushi Fever in Tissue Culture.**]—*Trans. Japanese Path. Soc.* 1932. Vol. 22. pp. 668-670.

Method.—A young normal rabbit was bled and the lung removed and cut into small pieces; these pieces were washed in Ringer's solution and placed for 20 minutes in an emulsion of infected rabbit testicle. The pieces of lung were then removed and cultivated in a medium of rabbit heparine plasma at a temperature of 38°C.

After ten days incubation the pieces of tissue were removed and examined and very numerous Rickettsia were demonstrated in the cells lining the alveoli of the lung and also in the histiocytes but not in leucocytes or red cells. The morphology of these organisms was studied and the authors state that they were identical with *R. orientalis* as described by Nagayo in the cells of Descemet's membrane.

D. H.

Nishibe (Masujirô), Hosono (Shichirô) & Miyazawa (Masaei). *Rickettsia orientalis* **in Tissue Culture.**—*Trans. Japanese Path. Soc.* 1932. Vol. 22. pp. 670–680.

The authors employed a similar method to that described in the previous paper by Kimura and others but in addition to normal lung tissue they employed embryo chick tissue with success. As well as in the alveolar cells they found that the organisms multiplied in the macrophages, in endothelial cells and in fibroblasts and in various types of cells in the embryo chick tissue. Employing these methods it was found that *R. orientalis* could be maintained without loss of virulence or numbers through 12 generations covering a period of 135 days. *R. orientalis* is essentially an intracellular parasite.

D. H.

Kawamura (R.), Imagawa (Y.) & Itô (T.). Weil-Felix'sche Reaktion bei der Tsutsugamushi-Krankheit. [**Weil-Felix Reaction in Tsutsugamushi Disease.**]—*Trans. Japanese Path. Soc.* 1932. Vol. 22. pp. 691–697.

The sera of 32 cases of tsutsugamushi fever were tested against cultures of Proteus; the strains employed were obtained from Dr. Felix of the Lister Institute and both the H & O forms of X_{19}, X_2 and XK were utilized.

All the sera gave negative reactions with the O form of X_2 and X_{19} but on the other hand all with one exception agglutinated XK, both O and H forms equally. Ten cases gave a positive reaction of 1/800 or higher, 17 reacted up to a dilution of 1/400 and 4 gave a positive in 1/100. The sera in some of the cases were taken some months after fever had ceased. Sera of infected rabbits and monkeys were also tested and gave a positive reaction with OXK, negative with OX_{19}. *D. H.*

Hayashi (Naosuke). **On Tsutsugamushi Disease.**—*Trans. Japanese Path. Soc.* 1932. Vol. 22. pp. 686–690.

The author points out that in 1922 he described the virus of tsutsugamushi fever and gave it the name of *Rickettsia tsutsugamushi*. Later other observers described a similar organism and named it *R. orientalis*. The majority of research workers in Japan are agreed that these two organisms are identical and therefore the name *R. tsutsugamushi* should stand. *D. H.*

Naritomi (C.). Das unbekannte Fieber der Boko-Inseln (Pescadores-Archipel) und der Nachweis von *Rickettsia orientalis* mit Hilfe der Augenkammer-Methode (Vorläufiger Bericht). [**The Unknown Fever of Boko Island and Demonstration of** *Rickettsia orientalis* **by Injection of the Anterior Chamber of the Eye.**]—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1933. Sept. Vol. 32. No. 9 (342). [In Japanese pp. 1291–1292. German summary pp. 128–129.]

An exanthematous fever has been noted for some years in the Islands of Boko in the Pescadores Archipelago (off Formosa). By injection of the blood of patients into the eyeball of rabbits this fever has now been proved to be identical with tsutsugamushi disease.

D. H.

Gomes (Luiz de Salles). Typho exanthematico de São Paulo. Virus exanthematico, sob condições naturaes, isolado de carrapato (*Amblyomma ovale* Koch) capturado em cão de zona infectada.—*Brasil-Medico.* 1933. Dec. 31. Vol. 47. No. 52. pp. 919–922. With 2 charts. English summary.

Hirszfeld (L.) & Halber (W.). Ueber die Bordet-Wassermannsche Reaktion bei Flecktyphus. Beitrag zur Theorie der B. W. Reaktion.—*Acta Path. et Microb. Scandinavica.* 1933. Supplement 16. pp. 114–131.

Moreira (João Affonso) & Magalhães (Octavio). Typhus exanthematicos em Minas Geraes.—*Brasil-Medico.* 1933. Aug. 26. Vol. 47. No. 34. pp. 599–601. With 5 charts.

Plazy (L.) & Damany (P.). Maladie de Basedow consecutive à un typhus endémique bénin.—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. pp. 992–993.

Tanaka (Keïsuke). Sind die japanischen Rickettsien die Erreger der Kedani-(Tsutsugamushi-) Krankheit ?—*Zent. f. Bakt.* I. Abt. Orig. 1933. Oct. 6. Vol. 129. No. 7/8. pp. 490–492.

CARRION'S DISEASE.

Ribeyro (Ramon E.). Verruga peruana y paratifo B. [**Verruga Peruviana and Paratyphoid B.**]—*Crónica Méd.* Lima. 1932. Dec. Vol. 49. No. 834. pp. 361–376. [11 refs.]

Much of this article consists of quotations of the work and opinions of others. It may be summed up briefly by stating that whereas ordinary verruga is quite a mild condition, when complicated by infection with *Bact. paratyphosum B* it becomes very serious; in fact the author states "every case of Oroya fever complicated by Paratyphoid B terminates fatally without exception." The figures he quotes certainly tend to support this contention :—

	Cases.	Infected with Para. B.	Died.	Recovered.
Dr. Ribeyro	19	6	6*	—
Dr. Arce	2	2	1	1
Dr. Tamayo	10	10	10	0
Dr. S. Bernales	3	1	1	0
Dr. Olaechea	2	0	0	2

* In the tabular statement there were 7 deaths, six infected with paratyphoid B and one with exanthematic typhus as a complication.

Dr. Tamayo is quoted as saying "the severe Carrion's disease is a verruga patient with paratyphoid" (La fiebre grave de Carrión es el Paratifus de los verrucosos), while Oroya fever itself uncomplicated is not a formidable infection [16 recovering out of 17 is one record quoted, the fatal case being complicated by typhus. Manson-Bahr gives the fatality at 10–40 per cent. (presumably taking all cases together)]. The obvious remedy is for those exposed to verruga to be prophylactically vaccinated against paratyphoid B. *H. H. S.*

Makehennie (Daniel). Mésenchyme et maladie de Carrion. [**Mesenchyma and Carrion's Disease.**]—*Rev. Sud-Américaine de Méd. et de Chirurg.* 1932. Apr. Vol. 3. No. 4. pp. 323–336.

Treats of Oroya fever and incidentally verruga from the histo-haematological aspect. The author describes first the Bartonella bodies and the best ways of staining them for purposes of study. He then details the histological findings in Carrion's disease (and verruga), especially the changes in the blood and haemopoietic organs.

Interposed is a disquisition on the histogenesis of the blood corpuscular elements with remarks on the different forms, or better perhaps, degrees of anaemia according to the severity of the case : 1. With simple regeneration—the presence of polychromatophilia, and normoblasts, basophilic stippling, Jolly bodies, etc.; 2. Hypoplastic with poor response (lenteur) on the part of the medulla; 3. Megalocytic, nearly always of grave prognosis.

From the haematological point of view also he subdivides the vascular reaction into three phases : 1. At the onset, predominance of "mesenchymatous" cells—i.e. Rocha's proliferation of angioblasts

en masse; 2. Reduction of these cells, but increase in endothelial cells, some embryonic, some mature; 3. Involution of vessels with predominant infiltration of eosinophils (though not in excess in the peripheral blood) and with extravascular leucocytes. He notes that a similar endothelial proliferation occurs in exanthematic typhus and Rocky Mountain fever.

The questions which he postulates: What is the explanation of the anaemia which, according as it is simple or pernicious, imparts a benign or malignant character to the infection? Is it due to the virulence of the organism (Bartonella) or to resistance set up by the patient? he proposes to deal with in a subsequent article. *H. H. S.*

Makehennie (Daniel). L'anémie dans la maladie de Carrion. [**Anaemia in Carrion's Disease.**]—*Rev. Sud-Américaine de Méd. et de Chirurg.* 1932. Dec. Vol. 3. No. 12. pp. 967–972.

The author discusses the various theories which have been put forward to account for the occurrence of severe and often fatal anaemia in Oroya fever. Six cases of verruga may occur in one household and only one develop this form of pernicious anaemia. He considers that variation of virulence of the parasite would not account for it and falls back on "personal idiosyncracy." He also suggests that secondary infections may play a part. *D. Harvey.*

Monge (Carlos) & Mackehenie (Daniel). Formas neurológicas de la verruga. [**Neurological Forms of Verruga.**]—*Crónica Méd.* Lima. 1933. April, May & June. Vol. 50. Nos. 838, 839 & 840. pp. 123–135; 158–162; 200–209. With 1 chart.

The authors give notes of a dozen cases of nerve conditions associated with verruga, half of them terminating in death. The majority appear to have been definitely related with verruga or Oroya fever as cause and effect, but one or two are less convincing. Thus in one with encephalitis and a terminal meningitis there was a positive Wassermann reaction and no anaemia, another presented symptoms of encephalitis, was cured and left hospital and "a month and a half later returned with a verruga eruption which ran a course without complications." A third is dismissed briefly thus, "a recent case of severe Carrion's disease in a child who the day before it died had a convulsive attack of an epileptiform character followed by coma and death." A fourth suffered from epileptic convulsions; his blood showed a uraemic condition with leucocytosis. It is true bartonella bodies were seen, but the evidence that the two were causally connected is scanty. The others presented symptoms of encephalitis, meningitis, cerebellar disease, cerebral haemorrhage, and bartonella bodies were found. The subject is one which deserves, in fact demands, further study. *H. H. S.*

Galliard (H.). A propos de *Bartonella bacilliformis* et *Eperythrozoon noguchii*. Unicité ou dualité de la verruga et de la fièvre de Oroya. [**Unity or Duality of Verruga and Oroya Fever.**]—*Bull. Soc. Path. Exot.* 1933. July 12. Vol. 26. No. 7. pp. 925–929.

It has been recently suggested by Lwoff that there are two organisms the one, Bartonella, responsible for verruga and the other

Eperythrozoon noguchii (Lwoff and Vaucel 1931) the cause of Oroya fever. This organism has been figured as coccoid bodies in the blood of monkeys by Noguchi but he did not consider them to be of pathological significance ; similar bodies have been described by other observers.

Lwoff believes that the reason why cultures from the blood of cases of verruga or Oroya fever produce verruga only in monkeys is because Bartonella can be cultivated whereas the eperythrozoon cannot. Galliard in the paper under review points out, however, that Noguchi did produce a condition resembling Oroya fever in monkeys by means of the injection of a culture of Bartonella ; and also the injection of the blood of cases of Oroya fever produces no result, whereas the same blood after culture and multiplication of Bartonella produces verruga.

Galliard does not accept the conclusion of Lwoff and holds that verruga and Oroya fever are different manifestations of the same disease. Bartonella can be observed in the red cells of cases of verruga and also in cases of Oroya fever and the eperythrozoon has not been observed in the blood of man. *D. H.*

DENGUE.

Jafar (M.) & Singh (Bachan). **Dengue Fever in the Rangoon-Mingaladon Area.**—*Indian Med. Gaz.* 1932. Dec. Vol. 67. No. 12. pp. 674–676. With 3 charts.

The authors state that dengue fever is endemic in Rangoon and neighbourhood ; sporadic cases occur throughout the year but chiefly in the rainy season, April to September, which is also the season of maximal prevalence of *Aëdes aegypti*.

Clinically the cases are mild, " break bone " pains being noted in a small percentage. The rash was only noted in 16 per cent. of the Europeans and in 5 per cent. of Indians. *D. Harvey.*

Watson (Malcolm). **A Case of Dengue Fever with Hyperpyrexia.**—*Jl. Trop. Med. & Hyg.* 1933. June 1. Vol. 36. No. 11. pp. 157–158. With 1 chart.

The patient was a Eurasian girl aged 13 months. The temperature reached 105·6° once in the arm pit and frequently over 104° in the rectum. Cold packs and sponging were employed when it rose over 102°. The desquamation which followed was as severe as that following scarlet fever. The child made a good recovery. *D. H.*

Akashi (Kazuyoshi). Die letzte Dengue-Epidemie in Tainan (Formosa).—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1932. July. Vol. 31. No. 7 (328). [In Japanese. German summary pp. 69–70.]

Cochrane (E.). First Reported Cases of Dengue Fever in British Guiana.—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1933. July 28. Vol. 27. No. 2. pp. 211–212.

LEPROSY.

DE SOUZA-ARAUJO (H. C.). Contribuição á epidemiologia e prophylaxia da lepra no norte do Brasil. [**Epidemiology and Prophylaxis of Leprosy in Northern Brazil.**]—*Mem. Inst. Oswaldo Cruz.* 1933. Sept. Vol. 27. No. 3. pp. 165–337. With 87 figs. on 45 plates.

This article, obviously the outcome of much careful study and observation, is unfortunately too detailed and subdivided for abstracting. The author gives the figures of the leper census in the various districts of Northern Brazil, the occupation of those affected, accounts of the many leprosaria, dispensaries, etc. and the cost. The whole is well and abundantly illustrated with photographs.

The following are the main conclusions :—

1. Among a population of 14,655,000 there are 7,964 known cases of leprosy and it is estimated that there are at least 13,400. Of the total 1,903 are isolated.

2. The problem is such that a national campaign should be undertaken at the national cost.

3. A proper census should be made and a clinical classification of the lepers found, if prophylaxis is to be effective. This would necessitate travelling commissions in the rural districts, and the members might at the same time undertake vaccination against smallpox, treatment for helminthiasis, for malaria, yaws, etc. *H. H. S.*

HIGGINS (M. E.). **Leprosy in the Philippines.**—*U.S. Nav. Med. Bull.* 1933. Oct. Vol. 31. No. 4. pp. 363–367.

This is a brief account of a visit of a U.S. Naval Surgeon to the Philippines leper institutions, including Culion with 5,700 cases and 2,000 segregated in treatment stations, in addition to early cases now being treated at " skin clinics " in the towns. An agricultural colony has now been provided near the Culion settlement for paroled patients who do not wish to return to their homes. In 25 years there has been no infection of any doctor, nurse or attendant on the lepers. Additional measures have been recommended to remove the highly susceptible children of leprous parents at birth, and for the sterilization of male lepers and birth control, but there are manifest difficulties. It is estimated that $11,000,000 have been expended on the control of leprosy since the Culion settlement was opened in 1906, and at present nearly one-third of the health appropriation is devoted to leprosy control. *L. Rogers.*

LEPROSY IN INDIA. 1933. Oct. Vol. 5. No. 4. pp. 177–244. With 13 figs. (8 on 3 plates). Issued quarterly by the Indian Council of the British Empire Leprosy Relief Association.

Most of this number is taken up with papers read at the Calcutta Conference in March 1933, a summary of which has already been published in " Leprosy in India."

An important paper is also included by Dr. E. MUIR on the Leprolin diagnostic test of Mitsuda. For this Muir has used intradermal injections of emulsions of lepra nodules containing Hansen's bacillus, which he calls H leprolin, and of the spleens of rats infected with the bacillus of Stefansky, which he calls S leprolin, both being tested

in his cases at the same time. The leprous material is boiled for one hour, dried in a desiccator and suspensions made as required by washing three times in saline; the sediment forming in 10 minutes is discarded, and the bacillary suspension diluted with 0·5 per cent. carbolic, 0·4 of the dried powder being thus made up to 100 cc., and a dose of 0·2 cc. injected intradermally. In healthy persons and recovered or burnt out nerve cases a reaction follows in the form of erythema and induration of 5 to 20 mm. in diameter, and in severe reactions pustulation at the centre; the extent of these should be noted weekly for six weeks. In active skin cases no reaction occurs, apparently owing to the tissues having become accustomed to the toxins formed by the causative organism. Six series of experiments were carried out from which the following conclusions were arrived at: Intradermal injections of suspensions of both pathogenic and non-pathogenic acid-fast bacilli produce reactions in healthy subjects, and in persons not infected with leprosy the H and S leprolins give about the same reactions, but in dermal leprosy with numerous bacilli only the S leprolin gives reactions. In very young children the reactions with both are negative or slight, indicating weak resistance to leprosy infection, and in nerve leprosy with few bacilli the reaction to Hansen's leprolin is increased, indicating resistance to the infection, a strong reaction indicating a favourable prognosis, so any treatment which changes a negative H reaction into a positive one is likely to be beneficial. *L. R.*

Denney (O. E.). **Leprosy in the Southern United States: from the Histories of 637 Cases Hospitalized in the National Leprosarium.**—*Southern Med. Jl.* 1933. Sept. Vol. 26. No. 9. pp. 763–768. With 6 figs.

This is an historical account of the incidence of leprosy in Louisiana and other portions of the Southern United States. The disease was introduced to the western hemisphere by the early settlers from Europe and by the African slave trade, and was not uncommon 150 years ago in the Mississippi delta. In 1872 it was found to be spreading among persons mainly of French descent. Spot maps and tables of the cases admitted to the Louisiana Leper Settlement at Carville, the Federal Leper Hospital since 1921, show that 434 of the 565 admissions from the Southern States were from Louisiana.

L. R.

Ortega Nieto (Luis). La lepra en Andalucía. [**Leprosy in Andalusia.**]—*Rev. San. e Hig. Pública.* 1933. Dec. Vol. 8. No. 12. pp. 598–614. With 2 graphs & 2 maps.

The author gives by way of introduction the numbers in round figures of lepers in the various countries; in Spain he mentions about a thousand. The figures for certain years are stated; thus in 1851 there were said to be 281, in 1914, 898, a fall in 1924 to 579, followed by rises to 739 in 1928 and 883 in 1932. A small map is reproduced showing by depth of shading the prevalence of leprosy in Spain; it varies from 82 in the Canaries and 57 in Málaga down to 1–2 in Almería. Of the whole of Spain Andalusía is the chief leprosy area and within it Málaga, Córdoba and Jaén head the provinces in numbers of lepers. Another map demonstrates this.

Next follows a list of provincial Leprosaria, remarks on the clinical aspects of the disease and its treatment, with respect to which there is nothing to record. The author concludes by saying that there is need of a leprosarium in Andalusía, with a section for incurables, and for treatment centres for infective patients ; also for an " orphanage " for the children. Medical men should be trained in leprosy diagnosis in order that the disease may be recognized in its early stages. *H.H.S.*

Kissmeyer (A.). Om spedalskhedens forekomst i de skandinaviske lande siden 1900. [**The Incidence of Leprosy in the Scandinavian Countries since 1900.**]—*Hospitalstidende.* 1933. Sept. 7. Vol. 76. No. 36. pp. 929–936. With 4 figs & 1 map.

Recent enquiries as to the incidence of leprosy in Iceland, Finland and the Scandinavian countries have yielded the following information.

Denmark.—Since 1900 only 5 cases have been observed, the source of infection in every case being some foreign country.

Iceland.—The primitive leper hospitals were abolished in 1848 on the assumption that leprosy was not an infectious but a hereditary disease. The disease, accordingly, spread, and in 1896 there were about 250 lepers. A leper hospital opened in 1898 accommodated 60 patients. In 1932 the total number of lepers was reduced to 25. The benign anaesthetic form of the disease is now much more common than the nodular form.

Finland.—A census of lepers taken in 1893 and repeated in 1897, 1904, 1924 and, most recently, in 1931, does not show the uniform decline observed in Iceland and Norway. There was, indeed, a considerable rise in 1904. As in Iceland, the nodular form of the disease has dwindled more rapidly than the maculo-anaesthetic form ; in 1904, the former represented 76 per cent. of all the cases, whereas at present it represents only 20 per cent. Most of the 34 lepers alive on Dec. 31, 1931, were old, as many as 26 of them being between the ages of 50 and 90. The geographical distribution of leprosy is limited to the south-west corner of the country.

Norway.—In 1931 there were only 58 lepers alive, and 44 of them were housed in two hospitals in Bergen. In the 5-year period 1926–1930, only 3 new cases were observed. During this period the number of surviving lepers was reduced by more than 50 per cent.—a death-rate which is explained by the high average age of the lepers.

Sweden.—In 1911 there were still 66 lepers alive. At the present time there are only a score. Here, too, the rapid decline in the number of lepers is due to their high average age and the scantiness of new recruits ; since 1928 only two new cases have been observed.

Kissmeyer associates the rapid decline and prospective extinction of leprosy in the countries under review with the isolation of the worst cases, particularly the nodular and mutilated forms.

C. Lillingston.

Leprosy Review. 1933. Oct. Vol. 4. No. 4. pp. 135–183. With 1 diagram, 2 plates & 2 figs.—Quarterly Publication of the British Empire Leprosy Relief Association, 29 Dorset Square, London, N.W.1.

Leprosy in the Federated Malay States is dealt with by G. A. Ryrie, who reports 353 admissions to the Federated Leprosy Settlement in

1932 and increase of the inmates from 996 to 1082. The death rate has been reduced by good nursing. Alepol intravenously did not give good results so the esters are being mainly used. The oral Tai Foong Chi treatment is not considered safe in early cases, as there is a risk of its inducing reactions with a more rapid spread of the disease. In the treatment of reactions 5–10 cc. of a 2 per cent. solution of mercurochrome intravenously is of value, as are 10–20 cc. of calcium glucinate intravenously. The Fiji Calophyllum oil esters were beneficial in nerve pains and reactions. The deaths were 61, or 5–6 per cent., with chronic nephritis found post mortem in all advanced cases, and 91 patients were discharged after six months observation with negative microscopical and clinical examinations.

In a report on four years work in the S. Rhodesia Ngomahuru Leprosy Hospital Dr. B. Moiser states " I am tempted to say that all early cases are curable, and many old-standing ones also." He found 3 per cent. solutions of alepol of little value, but with 1 to 10 cc. doses of 6 per cent. solutions twice weekly intramuscularly some remarkable cures were obtained, but the treatment is painful. The most painless injections were up to 5 cc. of iodized esters, to which all early cases reacted well, but it is expensive. Regular microscopical examinations are made and two years negative results are required as a rule before discharge, but over 260 have been sent out in four years.

In contrast to the above Dr. L. E. S. Sharp at the Kigezi Leper Settlement of S.W. Uganda obtained no demonstrable results from the use of hydnocarpus oil preparations in his leprosy cases, no less than 21·5 per cent. of which were very advanced nodular ones, " indicating very heavy infection." He advocates the settlement policy with ample land, which enables the lepers to " cultivate their own food and become more or less self-supporting within six months " ; this reduces the cost of their maintenance to a minimum. The children of the lepers are isolated from infected parents. *L. R.*

Leprosy Review. 1934. Jan. Vol. 5. No. 1. pp. 1–50. With 3 figs. on 2 plates & 1 chart. Quarterly Publication of the British Empire Leprosy Relief Association, 29 Dorset Square, London, N.W.1.

The Aden leprosy problem is dealt with by E. S. Phipson, who points out that lepers are being attracted to the Mission Leper Hospital from the surrounding areas in such numbers as to cause difficulties.

The treatment of lepra reactions by intravenous injections of 10 cc. of a 2 per cent. solution of " fluorescein-soluble " twice weekly is favourably reported on by G. A. Ryrie in the Malay States, for out of 31 cases 13 showed a rapid recovery after one or two injections and 15 more showed a decline of the fever by lysis after 3 to 6 injections. He regards its action as being similar to the fluorescein-containing mercurochrome, while it is less toxic. Calcium therapy and a milk and fruit diet help.

A belated account of the April 1933 meeting of the General Committee of Belra appears in this number, which was addressed by the Rev. P. B. Clayton the founder of Toc H, who had recently seen leprosy work in Malaya and Nigeria.

In the first part of an article on leprosy in India and Ceylon by R. G. Cochrane the resolutions of the 1933 Calcutta Leprosy Conference are reprinted.

In the first annual report of the Uzuakoli Leprosy Colony in S. Nigeria, J. A. K. Brown records the first eight months work in organizing the colony, which has 389 patients, nearly all advanced ones with little hope of improvement, but whose isolation is an advantage; 98 out-patients attended for treatment. The stronger patients work two days a week and grow food crops, and they have built two townships for the men and women respectively and made roads. The majority of the early cases, and the able bodied of the more advanced cases, are showing some improvement under treatment. *L. R.*

Burnet (Etienne). La lèpre et les missions. [**Leprosy and Missions.**] —*Rev. d'Hyg. et de Méd. Préventive.* 1933. Nov. Vol. 55. No. 9. pp. 690–695.

This short note points out that much of the care of the world's lepers is being undertaken by missions, the Roman Catholics providing priests and nuns to care for the spiritual needs and nursing, while Protestants supply medical missionaries who also undertake treatment. Dr. Burnet appears to think that these two functions should be kept separate, religious help being distinct from medical, a conclusion he has arrived at after extensive tours in leprous areas as Secretary to the Leprosy Commission of the League of Nations. *L. R.*

Soetomo & Soetopo. Bijdrage tot rationeeler bestrijding der lepra. [**A Rational Method for the Eradication of Leprosy.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. Oct. 10. Vol. 73. No. 21. pp. 1299–1308.

The contentions of the authors are summed up as follows :— 1. Children are susceptible and adults are little susceptible to leprosy. 2. Children play an important rôle in spreading leprosy. They are the chief source of infection, which is by direct contact and transmitted from child to child. 3. Any campaign against leprosy should be directed against children and should consist in removal of infected children from their surroundings and their consignment to institutions. 4. The object of these homes should be (*a*) the elimination of the source of infection ; (*b*) the treatment of leprosy in the early stage. A successful campaign on these lines involves the abandonment of the previous method of segregation of adult advanced cases.

W. F. Harvey.

Lowe (John). **Bacillaemia in Leprosy.**—*Indian Med. Gaz.* 1933. Sept. Vol. 68. No. 9. pp. 503–506. [23 refs.]

A brief survey of the literature is first given, and it is pointed out that some recent reports have claimed diagnostic value in finding acid-fast bacilli in thick blood films obtained by puncturing the skin, but in view of the frequency with which lepra bacilli are present in large numbers in apparently healthy skin this source of fallacy has not been allowed sufficient weight. A method of concentrating any bacilli present in 5 cc. of blood withdrawn by puncturing the antecubital vein through apparently healthy skin is described. It consists in decalcifying with citrate of soda, removing the red corpuscles and serum by centrifuging to leave only the deposited white corpuscles and bacilli, dissolving the white cells in 1 cc. of 10 per cent. antiformin and again centrifuging after adding 6 cc. of 30 per cent. alcohol, the small remaining deposits then being stained and examined for acid-fast

bacilli. Out of 23 nerve cases of leprosy 2 to 3 bacilli only were found in two cases in two hundred fields of the microscope. In 51 cutaneous cases a very small number of bacilli were found in 28 cases, but on examining slit smears of the punctured skin of the 21 vein-blood positive cases acid-fast bacilli were found in 15, which might account for the positive results in some of the vein bloods examined. He therefore concludes that lepra bacilli are very rare in the circulating blood of nerve cases, more common in that of cutaneous cases, but when found in thick films obtained by puncturing the skin they are usually derived from the skin itself. Examination of vein blood is therefore complicated and of little diagnostic value. *L. R.*

DE GRAAF (J. F. H.) & LEVIE (L. H.). Het voorkomen van zuurvaste bacteriën in het bloed bij leprapatiënten. [**Acid-Fast Bacteria in the Blood of Leprosy Patients.**]—*Nederl. Tijdschr. v. Geneesk.* 1933. Sept. 2. Vol. 77. No. 35. pp. 3955–3961. With 10 figs. on 1 plate. English summary (5 lines).

Reference is made by the authors to the work of SARDJITO and SITANALA (this *Bulletin*, Vol. 29, p. 848) on the finding of leprosy bacilli not only in thick blood-drop preparations from leprous lesions but also from the same type of preparations taken from an apparently sound finger. They have continued this investigation both for blood obtained from lesions or healthy areas of skin and for blood from a vein. The usual technique of the thick drop is followed and after dehaemoglobinization with distilled water the film is fixed with methyl alcohol. Staining is by carbol-fuchsin for 5 minutes, during which time the preparation is gently, not strongly, heated 3 times. Decolorization is effected by 1 per cent. sulphuric acid followed by 70 per cent. alcohol till no more fuchsin is removed. The preparation is now washed in water, counterstained with aqueous methylene blue 3 minutes, washed again, dried and examined with an oil immersion lens. In the case of the venous blood 3 per cent. sod. citrate is used to prevent clotting and dehaemoglobinization effected with either saponine or distilled water. As the majority of the bacilli are intracellular, within the leucocytes, the use of the leucocyte layer, obtained by sedimentation of the citrated blood, represents a concentration method. The possibility of acid fast bacilli being present in the reagents is well controlled by the authors. Other controls were also employed. Confirmation of the presence of acid-fast bacteria in the blood obtained from healthy skin areas was established. Acid-fast bacilli were demonstrated in the venous blood, that is, evidence was afforded of a bacillaemia. The greatest number of bacteria was found in the blood of cases of active nodular leprosy, few or none in the predominantly nervous type and they were absent in the " burnt-out " cases. Criteria of recognition of the acid-fast bacilli as leprosy bacilli were, (1) their occurrence in typical bundles (cigar packets) or enclosed in a zooglea, and (2) their frequent intracellular position. The authors are very cautious over the subject of healthy carriers of leprosy bacilli. *W. F. Harvey.*

LAI (Daniel G.). **Chinese Leprosy Cases in the U.S. National Leprosarium. A Clinical and Laboratory Study of 36 Patients with 7 Autopsy Reports.**—*Chinese Med. Jl.* 1933. Aug. Vol. 47. No. 8. pp. 772–784. With 1 fig.

This is a brief clinical study of the 36 Chinese patients who have been admitted to Carville, nearly all originally from Kwangtung, S. China.

Of these 32 were males, 80·6 per cent. were classed as mixed cases and only 8·8 per cent. of the skin type. The other data recorded are in accordance with general experience. *L.R.*

Féron. Lépreux tubéreux, lépreux maculaires et leurs plaies. [**Nodular, Macular and Ulcerous Leprosy.**]—*Arch. Méd. Gén. et Colon.* 1932. Nov. Vol. 1. No. 8. pp. 503–508. With 8 figs.

This is a short illustrated article describing the well known lesions of dermal leprosy as seen by the author in the St. Antoine leper institution in Ethiopia with its 154 patients. In treatment chaulmoogra and copper preparations are employed. *L. R.*

Ess (B. J.). **A Case of Neuropathic Arthropathy occurring in Leprosy.**—*Malayan Med. Jl.* 1933. Sept. Vol. 8. No. 3. p. 205.

This is a brief account of changes in the astragalo-calcaneal joint more especially resembling those of Charcot's disease and associated with loss of sensation of the nerves of the affected limb. *L.* R.

Labernadie (V.) & André (Z.). Essai de traitement de la lèpre par des injections intraveineuses d'huile de chaulmoogra pure. (Note préliminaire.) [**Intravenous Injections of Oil of Chaulmoogra.**]—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. p. 988.

Having found intravenous injections of chaulmoogra oil innocuous in tuberculosis the authors tried it in leprosy, and although it is too early to report the results their experience in 44 lepers shows that 1 cc. doses can be thus injected without immediate inconvenience to the patient. *L. R.*

Emerson (George A.), Anderson (Hamilton H.) & Leake (Chauncey D.). **Effect of Chaulmoogric Acid Derivatives on Lipolytic Activity in Vitro.**—*Proc. Soc. Experim. Biol. & Med.* 1933. Nov. Vol. 31. No. 2. pp. 272–273.

——,—— & ——. **Comparative Biological Activity of Seven New Water-soluble Chaulmoogric Acid Derivatives.**—*Ibid.* pp 274–277.

In the first of these notes chemical evidence is given for thinking that the *in vitro* lipase stimulating action of gynocardates of Shaw-Mackenzie is not a real one. In the second note the activity of seven new water-soluble chaumoogric acid derivatives is examined in rat leprosy and *in vitro* on acid-fast bacilli, the most promising of which is Na-dichaulmoogric-B-glycerophosphate (chaul-phosphate for convenience). It can be given intravenously like alepol. *L. R.*

Féron. Notes sur le traitement des poussées aiguës de lèpre par les injections intraveineuses de gonacrine. [**Treatment of Exacerbations of Leprosy by Intravenous Injections of Gonacrine.**]—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. pp. 981-987. With 5 figs.

In acute exacerbations of leprosy, with fever and tumefaction of the leprous tissues, the author tried intravenous injections of gonacrine (dose not given) in view of its good effects in painful congestions of rheumatism. He records and illustrates three nodular cases of leprosy in which rapid decline of the reactions followed this treatment, and he considers that it may prevent the necessity for tracheotomy in such reactions affecting the larynx. *L. R.*

Reenstierna (J.). Premiers résultats de traitement de la lèpre par un sérum expérimental. [**First Results of Treatment of Leprosy by an Experimental Serum.**]—*C. R. Acad. Sci.* 1933. Oct. 2. Vol. 197. No. 14. pp. 718–720. Also in *Arch. Inst. Pasteur de Tunis.* 1933. Nov. Vol. 22. No. 3. pp. 364–366.

A serum has been prepared by repeatedly injecting sheep with cultures of Kedrowsky's bacillus obtained from a leper, and has been tried in two advanced cases of tubercular leprosy in Sweden. In the first case a large recent leproma soon decreased to one-third of its former size and at the end of a month a number of old lepromata had been entirely absorbed. The second patient had complicating eye trouble affecting the cornea. A score of ulcers healed after three weeks and the rest at the end of a month, while the corneal leproma had decreased in size and become less active. The treatment is being continued and it is hoped that it will assist other methods. *L. R.*

Emerson (G.), Anderson (H. H.) & Leake (C. D.). **Lipolytic Activity of Rat Lepromata during Treatment with Various Antileprotics.**—*Proc. Soc. Experim. Biol. & Med.* 1933. Oct. Vol. 31. No. 1. pp. 18–20. [10 refs.]

Changes in the lipase content of lepromata during intensive injection of antileprotic drugs into the lesions have been investigated in rats, with the result that the low lipase content of leprous tissues, which they attribute to the great dilution of the tissues by low lipase-containing bacilli, was found not to be raised by the injection of ethyl chaulmoograte, alepol, etc. They therefore think it is doubtful if the efficacy of chaulmoogra derivatives is due to an indirect stimulation of the lipolytic activity of the tissues as suggested by Shaw-Mackenzie and Rogers [see this *Bulletin*, Vol. 30, p. 240]. *L. R.*

Bergman (R. A. M.), Sitanala & Sardjito. Een proef met het kweeken van leprabacillen in culturen van leucocyten in vitro. [**An Experiment in the Cultivation of Leprosy Bacilli in Cultures of Leucocytes** *in Vitro.*]—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1933. Vol. 22. No. 3. pp. 189–196. With 6 coloured figs. on 1 plate.

Sardjito and Sitanala have used the thick drop method to demonstrate the occurrence of leprosy bacilli in the circulating blood (this *Bulletin*, Vol. 29, p. 848, Vol. 30, p. 242). The present authors have attempted by the method of tissue culture of the leucocytes from the blood of a leper to induce growth of leprosy bacilli under conditions closely approximating to their natural surroundings, with some measure of success.

The culture medium used was the coagulated blood plasma of the leprosy patient himself and the culture material was the washed top-layer of leucocytes of his centrifuged whole blood. A hollow slide and a mica cover glass formed the apparatus for the micro-culture and microscopic examination of the incubated cultures was made daily. Control cultures of normal leucocytes were not made, but the authors enter into the question of the possibility that the appearances seen by them were artefacts. A coloured plate is given of the day-to-day appearances (Ziehl-Neelsen stain) of the cultures. These illustrations

commence with the appearance of the thick drop and show in succession (1) the acid-fast bacilli with central granule, acid-fast granule and non-acid fast granule after 48 hours incubation, (2) acid-fast bacillus, acid-fast granule, acid-fast bacillus with dark central granule, " globus " of acid-fast bacilli on the 4th day of culture, and (3) small red granules and large red floccules on the 5th day.

The authors hold that they have shown that it is possible to maintain leprosy bacilli alive in leucocyte cultures for at least six days and that still more important development might be expected with improved culture technique, such as would prolong the life of the culture.

W. F. Harvey.

Araujo (H. C. de Souza). Tentativas infructiferas de cultura do *Mycobacterium leprae* pelo methodo de Löwenstein. [**Fruitless Attempts at Cultivation of *Mycobacterium leprae* from the Blood.**]—*Brasil-Medico.* 1933. Feb. 25. Vol. 47. No. 8. pp. 131–132.

This article is of value as a frank account of work carefully performed, and the details of the author's methods are stated.

Impressed by the results reported by Ota and Sato (this *Bulletin,* Vol. 29, pp. 268 and 551) the author undertook a series of tests in the last half of 1932. He obtained 26 samples of blood from 17 lepers in whom the disease was in an active stage, C_2 and C_3 of the Manila classification ; some were taken in the febrile periods with a bacteriaemia. At least 12 cultures were attempted with each, and with some 24, others even 36, using the following media : those of Löwenstein, Petroff, Petragnani, Shiga's glycerine potato and glycerine broth agar. The following was the technique adopted :—

Blood was taken by venepuncture and 10 cc. was placed in a sterile tube containing 2 cc. of 20 per cent. sodium citrate and strongly shaken. It was then centrifuged and the supernatant fluid decanted within 2 hours and the sediment treated with 3 per cent. acetic acid to dissolve the red corpuscles ; after centrifuging for 20 minutes, the supernatant was again decanted, the residue well washed with distilled water, again centrifuged, and the deposit treated with 5 per cent. sulphuric acid ; centrifuged, decanted, and the deposit again treated in the same way till a pasty, chocolate-coloured mass was left for making cultures.

Daily examination of the cultures was made, some became contaminated with moulds and were discarded, but some of each group remained uncontaminated. The author states that after being studied for 6 months the cultural attempts were entirely negative : smears of the sediment rarely showed acid-alcohol-fast organisms. " Anxious to know whether the sulphuric acid inhibited cultures, so-called, of *Myco. leprae,* I treated some strains by Shiga's method, obtained from human cases for culture. Strains of Kedrowsky, Brinckerhoff and McCoy grew freely, while those of Currie, ' Lepra 18 ' of the Lister Institute, Deycke, and the two varieties of Ota and Sato did not grow in any medium." Nojima had shown that 5 per cent. sulphuric acid killed cultures of the organism in 60 minutes, but the author's material was never exposed to it for longer than 30 minutes. Of 400 tubes examined, he found a few acid-alcohol-fast bacilli in seven, mostly degenerated forms. These occurred in Löwenstein's medium once, in Shiga's three times, twice in glycerin agar and once in glycerin broth ; the cultures had been put up for periods ranging between 33 and 153 days. Attempts at subculture proved negative. He is at a loss to explain the discrepancies between Ota and Sato's results and his own. *H. H. S.*

McKinley (Earl B.) & Verder (Elizabeth). **Further Studies on the Cultivation of *Mycobacterium leprae*.—*Proc. Soc. Experim. Biol. & Med.* 1933. Nov. Vol. 31. No. 2. pp. 295–296.**

In this brief paper the authors state that they now find that human embryonic tissue of the liver, spleen or lung is a better culture medium than that of chick embryo recently recommended by one of them, although the former is more difficult to obtain. The leprosy nodules are digested with 3 per cent. sodium hydroxide to free the organisms from the tissues, neutralized and inoculated into the tissue medium suspended in Tyrode's solution. Evidence has been obtained that the acid-fast organisms multiply through several generations [see this *Bulletin*, Vol. 30, p. 559]. *L. R.*

Rodriguez (J.), Mabalay (E.) & Tolentino (J. C.). **Gram-Positive Forms of *Mycobacterium leprae* from Leprotic Lesions Bacteriologically Negative for Acid-Fast Organisms: a Preliminary Report.**]—*Philippine Jl. Sci.* 1933. Aug. Vol. 51. No. 4. pp. 617–629.

The authors have applied to leprosy organisms the staining method by means of which Much in 1907 reported having demonstrated in tubercular material non acid-fast but Gram positive granular bacilli and granules which were virulent. The present workers examined numerous smears by both Much's and Ziehl-Neelsen's methods in Philippine lepers re-examined at regular intervals. Patients who had become bacteriologically negative were kept under observation for a year before being paroled, during which the acid-fast bacilli were less frequently found in from 45 per cent. during the first four months to 16·6 per cent. at the end of the period. On the other hand, granular bacilli were found by Much's method in 57 per cent. in the first period and in 66 per cent. in the last one, and also in one-third of " closed " cases in which acid-fast ones had never been demonstrated. They believe that many of these Gram-positive forms are not merely degenerate forms, as they were numerous in " closed " or " incipient " cases of leprosy which had not undergone treatment. *L. R.*

i. Nodenot (L.) & Berny (P.). Inoculation du bacille de Hansen dans le péritoine de rats après blocage. [**Inoculation of Hansen's Bacilli into Rats.**]—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. pp. 989–990.

ii. Tisseuil (J.) & ——. Inoculation du bacille de Hansen directement dans le foie des rats.—*Ibid.* p. 990.

iii. —— & Gillier (R.). Inoculation testiculaire de la lèpre humaine au rat.—*Ibid.* Nov. 8. No. 9. pp. 1134–1135.

iv. Gerbinis (P.). Essais de culture du bacille de Stefansky.—*Ibid.* pp. 1135–1137.

i. In the first of these short notes L. Nodenot and P. Berny report on the intraperitoneal injection to rats of fresh emulsions of human leprosy nodules after " blockage " by first injecting a mixture of phosphates and calcium chloride. They were unable to confirm the results of Cantacuzène and Longhin [this *Bulletin*, Vol. 30, p. 239] concerning the development of Hansen's bacillus in the peritoneal cavity of rats.

ii. Tisseuil and Berny report on the injection of Hansen's bacillus into the liver of rats with negative results.

iii. Tisseuil and Gillier report on the inoculation of human leprosy material into the testicles of rats ; they found that the lepra bacilli may be preserved there up to two years, but no generalization takes place as earlier reported by BAYON.

iv. P. Gerbinis reports attempts to cultivate the bacillus of Stefansky of rat leprosy from the blood by the method of Löwenstein ; results were negative. *L. R.*

AOKI (Yoshio) & MURAO (Kitoshi). Zur Brauchbarkeit des Witebskyschen Prinzips der Tuberkulose-Komplementbindungsreaktion für die Lepra. [**Employment of Witebsky's Principle in Leprosy Fixation Reaction.**]—*Ztschr. f. Immunitätsf. u. Experim Therap.* 1933. Vol. 79. No. 5/6. pp. 365–371.

The authors conclude that the Witebsky, Klingenstein and Kuhn tubercle antigen can give strong reactions with the sera of leprosy cases, and that a leprosy antigen made according to the Witebsky method can be used for the serum diagnosis of leprosy. *L. R.*

BALIÑA (Pedro L.) & PUENTE (José J.). La campaña sanitaria antileprosa en la Argentina. Plan de organización ; sus conexiones e interdependencia con la lucha antivenérea.—*Semana Méd.* 1933. Dec. 7. Vol. 40. No. 49 (2082). pp. 1765–1772.

CONTINENTINO (Lincoln). Recommendações suggeridas para a conveniente localização e installação de leprosarios no Brasil, segundo os príncipios correntes de engenharia sanitaria.—*Brasil-Medico.* 1933. Nov. 25. Vol. 47. No. 47. pp. 833–841.

FIDANZA (Enrique P.). Estado actual del tratamiento de la lepra.—*Semana Médica.* 1933. Apr. 20. Vol. 40. No. 16 (2049). pp. 1325–1336.

FIDANZA (Enrique P.). La campaña antileprosa en Santa Fe.—*Semana Méd.* 1934. Jan. 11. Vol. 41. No. 2 (2087). pp. 124–129.

GOMES (J. M.). A lepra e a luz natural.—*Brasil-Medico.* 1933. Aug. 5. Vol. 47. No. 31. pp. 551–553. English summary.

INDIAN MEDICAL GAZETTE. 1933. Oct. Vol. 68. No. 10. pp. 600–602.—All-India Leprosy Conference.

THEWLIS (Malford W.). Leprosy : Report of a Case.—*Med. Times & Long Island Med. Jl.* 1933. Oct. Vol. 61. No. 10. p. 306.

YAWS AND SYPHILIS.

VAN NITSEN (R.). Pian et syphilis. Caractères différentiels. [**Yaws and Syphilis. Differential Characters.**]—*Bruxelles-Méd.* 1933. June 4. Vol. 13. No. 31. pp. 852–859. With 1 map.

An attempt to controvert the arguments of BLACKLOCK [see this *Bulletin*. Vol. 30. p. 185 & 739].

Professor BLACKLOCK questioned the validity of some points, commonly given in text books, for the differential diagnosis of yaws and syphilis. Van Nitsen in turn has submitted BLACKLOCK's opinions and the arguments he used in their support to severe criticism. Many of BLACKLOCK's ingenious arguments, he states, were based upon unwarranted assumptions, others upon evidence which was very doubtful and towards these attention is drawn.

BLACKLOCK in support of his opinion that yaws could be hereditarily transmitted quoted two cases of yaws in infants cited by older writers but there is no evidence that both children were not infected after birth. He propounded an idea that inheritance in yaws would only probably occur under a special set of circumstances; though the theory showed powers of imagination there was no evidence produced in support of the idea. He suggested that yaws was almost exclusively a disease of childhood and that few women suffered from yaws at a time when they might be expected to transmit the disease to the foetus. This of course is not a correct statement of fact; many women in endemic areas suffer from florid yaws during their pregnancy. The abortion rate among women so suffering is no greater than among others. Reference has already been made (this *Bulletin*, Vol. 30, p. 596) to the investigations of Wassermann, Hecht and Meinicke tests in the case of a ten-day-old infant, child of a mother suffering from florid yaws. All were negative. All the evidence in fact goes to prove in contradiction to Professor BLACKLOCK's opinion that yaws is never hereditarily transmitted.

BLACKLOCK throughout his article would try and insist that only syphilis contracted in childhood with extragenital chancre should be compared with yaws if the comparison is to be a valid one for purposes of distinguishing the two diseases. His reasons are not very apparent except that he appears to believe as above stated that yaws is seldom acquired in adult life. He fails to take the opportunity of comparing adult acquired syphilis with adult yaws and genital primary lesion, a not so very rare condition. BLACKLOCK again has attempted to make much out of some difference of opinion in the description of the yaw lesion by two writers in different parts of the world, and uses this as an argument for considering the lesion as non-specific in face of the findings of nearly all framboesiologists. The typical primary and secondary lesions of yaws are not reproduced in syphilis, and though tertiary yaws lesions may resemble somewhat those produced by other diseases such as leprosy, leishmaniasis, syphilis, etc., most of them manifest specific characters.

BLACKLOCK would believe that the characters of the "foot yaw" are caused by walking bare-foot but for this suggestion there is no evidence—the foot yaw is a lesion due to yaws and never seen in a bare-footed native syphilitic.

BLACKLOCK'S ideas upon the incidence of mucous membrane lesions in yaws are based on false assumptions. While lesions of the mucous

membranes are the rule in syphilis it has yet to be proved that they occur in yaws except by extension from the skin. Yaws lesions therefore do not arise in mucous membranes.

[It may be pointed out once again that in the past lesions have often been referred to as occurring on a mucous membrane when in fact they have been on skin, the authors being ignorant apparently where skin ends and mucous membrane begins. Lack of opportunity for continuous observation in human yaws also accounts for the failure to trace, as has been done by SCHÖBL in monkeys, the evolution of what would appear to be isolated yaws lesions of the mucous membrane in the nasopharynx. SCHÖBL has shown that a lesion starting in the skin in the neighbourhood of the nostril in the monkey may " creep " along the mucous lining, spread forwards being attended by healing behind so that eventually the lesion appears isolated on the mucous membrane. It is these lesions which subsequently give rise to gangosa as was shown in the monkey.]

In regard to pruritus all will agree with BLACKLOCK that in native races subject to a multitude of skin affections this symptom is worthy of but scant consideration in differential diagnosis. On the other hand BLACKLOCK is wrong when, on the authority of a single observer who has stated that alopecia occurs in yaws, he believes this sign has no value in differential diagnosis. All other observers are agreed that alopecia occurs in syphilis and not in yaws. The fallacies underlying much that has been written concerning the occurrence of ocular, visceral and nervous manifestations in yaws are exposed. BLACKLOCK's arguments must stimulate interest but they prove nothing as regards the unity of yaws and syphilis.

Many points in the differential diagnosis of the two diseases were not touched on by BLACKLOCK, some of these van Nitsen thinks should not be left out of the discussion, namely :—

(1) The strict limitation in the geographical distribution of yaws ; syphilis on the other hand being world-wide in its incidence.

(2) The biological difference in the two spirochaetes—one always reproduces yaws, the other syphilis.

(3) Though there is some experimental evidence of a crossed immunity in the two diseases in animals [with differences as pointed out by SCHÖBL] yet there is little or none to show that one disease protects against the other in man. Observations in Africa have demonstrated that past yaws does not protect against syphilis. In Tanganyika-Moëro when syphilis was introduced among a people in an area where yaws was endemic they showed no immunity to syphilis. The converse is not rarely seen—persons who have had syphilis may later contract yaws.

Van Nitsen holds that the criteria used in the differential diagnosis of yaws and syphilis, whose validity BLACKLOCK has tried to assail, hold good. *H. S. Stannus.*

MATTLET (G.). Syphilis et pian. [**Syphilis and Yaws.**]—*Bruxelles-Méd.* 1933. Sept. 17. Vol. 13. No. 46. pp. 1337–1342. [16 refs.]

A paper upon the differential diagnosis of yaws and syphilis which consists of a reiteration of the points of resemblance and the points of dissimilarity of the two diseases, all of which are well known.

Among the latter are mentioned the following : The lesions produced in the monkey and the rabbit by the virus of yaws and the virus of syphilis resemble those occurring in man in the two diseases respectively and do not resemble each other.

On cultivation the spirochaete of syphilis preserves its virulence for a certain time ; the virulence of the yaws spirochaete is lost very rapidly. The organism of yaws is less sensitive to mercury but more sensitive to arsenic and bismuth than that of syphilis. The virus of yaws is dermotropic, that of syphilis mesodermotropic.

In yaws the central nervous system is not affected, the cerebrospinal fluid is always normal ; yaws does not cause abortion and is never transferred to the foetus ; it is never inherited as opposed to syphilis. A European infected with yaws suffers from clinical yaws. The pathological changes underlying the clinical manifestations are of the same order.

Further research is necessary. *H. S. S.*

Blacklock (D. B.). Note sur le même sujet.—*Bruxelles-Méd.* 1933. Sept. 17. Vol. 13. No. 46. pp. 1343–1347. [13 refs.]

Professor Blacklock replies to the criticisms of van Nitsen upon his previous paper on the relationship of yaws and syphilis published in the *Annals of Tropical Medicine and Parasitology*. Both these articles received notice in this *Bulletin* (Vol. 30, p. 185 and above).

As so often happens in discussions of this kind different observers put different interpretations upon the facts *as far as they are known*. van Nitsen's criticism has served to draw from Blacklock however the following opinion : No one has up to the present time succeeded in proving scientifically either that yaws and syphilis are the same disease or two different diseases. Blacklock then deals in turn with the diagnostic criteria given by van Nitsen, submitting each to criticism along the lines he has already used in his previous paper.

van Nitsen would place Blacklock [as indeed the reviewer had done after reading the first paper] among the "*unicistes*." Blacklock now seeks to identify van Nitsen with the *dualists*. Doubtless the truth is, as most of those interested in the problem would agree, that it is one that is still *sub judice* and they would prefer to speak of their opinions as based on their interpretation of what they would call the balance of evidence. *H. S. S.*

Hasselmann (C. M.). **Our Present Conception of the Relationship of Yaws to Syphilis.**—Reprinted from *Caduceus* (*Univ. of Hongkong*). 1932. Aug. Vol. 11. No. 3. pp. 105–112.

In this paper, read before the Hong Kong Medical Society, the author reviews the relationship of yaws to syphilis in the light of the experimental results obtained by Schöbl and himself in the Philippine Islands. The published work of Schöbl has been noticed in this *Bulletin*, but the article under review forms a useful summary of some of the salient points in the problem and is worthy of reading by all those interested.

These authors find that the two treponemas give different biological reactions—the one is essentially ectodermotropic, the other shows mesodermotropism.

The regional lymphatic glands in yaws-infected monkeys only harbour treponemata so long as active yaws lesions are present ;

after healing has taken place, glands transplanted into clean monkeys do not cause infection. *Sp. pertenuis* does not survive and multiply in the mesodermic lymph gland ; *Sp. pallida* on the other hand does survive in the glands of infected animals.

The primary lesion in yaws is a papule ; the treponemata are found mainly in the rete Malpighii. The typical pathological picture in the yaws lesion shows acanthosis with enormous down-growths of the rete pegs, sometimes spongiosis, parakeratosis and hyperkeratosis to a lesser degree. There is little reaction in the cutis proper. The blood vessels in connexion with the initial lesion and generalized efflorescence remain unaffected ; the intima remains intact and shows no cellular infiltration nor endothelial profileration to any extent. There is a loose cellular infiltration, with ill-defined margin, of the stratum papillare and s. reticulare by plasma cells with but few eosinophils, round cells and fibroblasts and as a rule no giant cells, and an associated migration of leucocytes into the epidermis, sometimes with the formation of intradermal miliary abscesses.

The clinical picture thus produced is a soft papilloma, slightly raised above the surface of the skin ; the stratum lucidum and s. granulosum are lost and the serum which oozes on the surface forms a non-adherent amber-coloured crust. There is no induration and no tendency to ulcerate as there is no obliteration of blood vessels.

In syphilis the initial lesion is also a papule but the treponemata are found predominantly in the corium and subcutis. There is early infiltration of the intima of the capillaries and endothelial proliferation causing obliteration of their lumina, coagulation necrosis follows and ulceration at an early stage results. The infiltration is more defined, plasma cells do not predominate as in yaws and giant cells are commoner.

The typical metastatic generalized yaw is identical histologically and clinically with the primary lesion.

In syphilis none of the subsequent skin lesions resemble the initial chancre. The primary sore in syphilis runs a definite course—papule, sclerosis, chancre, fibrosis to healing.

In yaws the primary lesion may persist throughout the whole stage of the generalized eruption and persist after it has subsided to change into a late ulcerative type of lesion, a condition probably associated with retarded immunity and the onset of allergy. In such cases the secondary eruption has usually been slight or modified. Where the metastatic crop of yaws has been prolific, rapid healing of the primary lesion usually occurs, a high degree of immunity is induced and late ulcerative lesions do not appear.

Gangosa is a late ulcerative lesion associated with the allergic state. Keratoderma plantare et palmare with the enormous hyperkeratosis, marked parakeratosis and acanthosis and but slight inflammatory reaction in the corium is also probably an allergic reaction in the specialized tissue of a particular site.

Bone lesions other than those in gangosa, which are due to direct spread, have not been reproduced in experimental animals, and their pathogeny remains in doubt.

The W.R. positive in the blood in yaws and syphilis is never positive in the C.S.F. of yaws.

Immunity is defined as that state in which inoculation with an active virus fails to produce symptoms of the disease. It varies in degree from full immunity in which multiplication of parasites is

completely inhibited and they die out, to a low grade resistance to infection in which there is a restriction of the multiplication of the organisms. Immunity, therefore, does not infer that parasites are killed immediately on inoculation.

In syphilis immunity sets in early, in yaws not for some six months. Crossed immunity develops later than homologous immunity. Crossed immunity to syphilis in a yaws-infected monkey is developed in nine or ten months.

Immunity is independent of the persistence or otherwise of lesions. A heterologous immunity to syphilis in a yaws infected native population probably is a real factor affecting the incidence of syphilis. The assertion that among the natives of Haiti yaws produces visceral lesions and affections of the nervous system is incorrect as shown by the subsequent observations of Howard Fox.

In demonstrating the differences in biological behaviour of the two treponemata *Cynomolgus philippinensis*, the common Philippine monkey, is an excellent experimental animal. *H. S. S.*

VAN DER SCHAAR (P. J.). Entingen met framboesia bij lijders aan dementia paralytica. [**Inoculation with Yaws in Paralytic Dementia.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1933. Aug. 29. Vol. 73. No. 18. pp. 1138–1145. [24 refs.]

The inoculation of yaws spirochaetes to 40 paralytics was without result except in the only patient with negative Wassermann reaction.

The author's presentation of the subject is full of interesting information both critical and technical. It is therefore somewhat disappointing to find that, although the idea of therapeutic vaccination of a sufferer from a spirochaetal disease with spirochaete material is very reasonable, he comes to a negative conclusion regarding its present value. It is the inoculation of living spirochaetes of framboesia which forms the thesis. One great difficulty arises in the application of the method, which is the possibility of development in the syphilitic of a second symptomless infection and the doubt whether this is of any advantage to the patient. Some interesting facts emerge from the author's trials which amounted to 48 injections in 28 different persons, mainly paralytics, but among them some sufferers from cerebral syphilis. Seven strains of framboesia were used. In 41 inoculations serum was used on 40 occasions and in one case a transplant. The first 40 inoculations were negative as regards the production of any lesion but the transplant gave rise to a yaws nodule. Moreover the positive result occurred in a patient with negative Wassermann reaction ; all the others had a positive reaction. This is in accordance with a previous finding of JAHNEL for syphilitic reinfection and is considered to be highly significant also for the question of the identity of yaws and syphilis. On the main subject of inoculation with framboesia the conclusion arrived at is that " the method has no application until it is known whether the symptomless superimposed infection is therapeutically advantageous for the paralytic." *W. F. Harvey.*

HARLEY (George W.). **The Symptomatology of Yaws in Liberia. Part I.—The Seven Cardinal Symptoms.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1933. June 29. Vol. 27. No. 1. pp. 99–104.

This article is in itself a summary and does not lend itself very easily to being summarized. It deals with an attempt to analyse by statistical

methods the clinical findings among 5,597 cases of what were in the first instance designated "treponematosis" met with among the native inhabitants treated at Ganta, Liberia.

In these 5,597 cases, which formed 89 per cent. of consecutive patients attending the dispensary, the diagnosis was made on clinical grounds and the therapeutic response to sodium potassium bismuth tartrate was observed without serological tests and as observations accumulated the diagnosis of treponematosis was abandoned in favour of yaws.

The statistical analyses went to show that certain symptoms might be presumed to be cardinal symptoms of yaws. Significant associations of various pairs of these seven cardinal symptoms have been observed and the value of partial associations and correlations is pointed out. The expectancies calculated in this study are not true expectancies as records of control groups were not available. The seven cardinal symptoms are given as (1) enlarged epitrochlear glands, (2) rheumatic pains, (3) granulomata and ulcers, (4) periostitis and gross bone lesions, (5) planto-palmar dermatitis (including crab-yaws), (6) nail changes, (7) joint lesions. There was a tendency to the following groupings :—(*a*) Secondary granulomata and epitrochlear enlargement, (*b*) planto-palmar dermatitis, epitrochlear enlargement, nail changes and sometimes rheumatic pain, (*c*) bone changes, joint lesions, epitrochlear enlargements and rheumatic pain, (*d*) ulcerations with epitrochlear enlargements and sometimes bone or joint lesions. *H. S. S.*

HARLEY (George W.). **The Symptomatology of Yaws in Liberia. Details of the Statistical Method used in this Study.**—*Jl. Trop. Med. & Hyg.* 1933. Aug. 1, 15 & Sept. 1. Vol. 36. Nos. 15, 16 & 17. pp. 217–223 ; 235–242 ; 252–256.

In this article is given in full an analysis by statistical methods of 5,597 cases of yaws in Liberia (see above). The subject does not lend itself readily to summary and the paper should be consulted in the original by those interested in this method of study.

For the clinician the following conclusion is of importance—"Goundou and gangosa are very closely related to each other and both are undoubtedly manifestations of yaws."

The incidence of goundou and of J.A.N. was as follows :—

Goundou 18 male 22 female 1 unknown sex = 41 : 0·7 per cent.
J.A.N. 198 „ 140 „ 10 „ „ = 348 : 6·2 „ „

H. S. S.

NGUYEN-VAN-TUNG. A propos d'un cas de chancre mixte extra-génital et d'un cas de chancre pianique. Les caractères cliniques du pianome primaire. [**Cases of Mixed Extragenital Chancre and of Yaws Chancre.**]—*Bull. Soc. Méd.-Chirurg Indochine.* 1933. May. Vol. 11. No. 3. pp. 229–236. With 1 fig.

Reports (1) a case of syphilitic chancre of the finger complicated by an infection with Ducrey's bacillus, (2) a framboesial "chancre" of the leg, with notes upon the differential diagnosis of extragenital syphilitic and framboesial chancres in Cochin China.

In the first case the lesion was situated at the base of the middle finger. Dark ground examination revealed Ducrey's bacillus but no spirochaetes were found. Vernes = 85. The epitrochlear and axillary glands on the same side were enlarged.

In the second case associated with a primary yaw on the leg there were an acneiform eruption on the face and chest and patches of what MONTEL has called " chair de poule pianique " on the back. The primary lesion contained numerous treponemata. Vernes = 45.

H. S. S.

HASSELMANN (C. M.). **Ulcer of the Leg. Its Localization as a Point of Differential Diagnosis in Syphilis and Yaws Endemic Countries.** —*Arch. Dermat. & Syph.* 1933. July. Vol. 28. No. 1. pp. 44–52. With 5 figs. [14 refs.]

The greater frequency of non-syphilitic ulcerations on the left leg has been pointed out by GOODMAN. Among 64 patients in yaws-free New York the W.R. was negative in 73 per cent. of left leg ulcers and in 40 per cent. right leg ulcers, while the reaction was negative in 85 per cent. of cases in which both legs were affected.

Among 175 cases of leg ulcer in a yaws area in the Philippines the W.R. was negative in 80 per cent. left leg ulcer, 64 per cent. right leg ulcer and 74 per cent. cases in which ulcers were present on both legs. These non-treponematous ulcers are probably initiated by trauma, possibly associated with dietary deficiency but are not due to spirochaete-fusiform infections. *H. S. S.*

MONSERRAT (Carlos). **The Effect of Neosalvarsan Treatment on the Late Serologic Positive Vernes, Wassermann, and Kahn Reactions in Philippine Monkeys inoculated with Yaws or both Yaws and Syphilis.**—*Philippine Jl. Sci.* 1933. Aug. Vol. 51. No. 4. pp. 435–445. With 2 figs.

This research follows on that described in this *Bulletin*, Vol. 29, p. 387.—

" 1. The Vernes test was found to be as sensitive a method as the Wassermann and Kahn reactions with the blood of Philippine monkeys inoculated with yaws or both yaws and syphilis.

" 2. Marked serologic changes, under the influence of neosalvarsan injections, can be more easily demonstrated and evaluated by the Vernes test than by the ordinary Wassermann and Kahn methods.

" 3. The Vernes reaction is a quantitative reaction and the results are more accurate than those of the ordinary Wassermann and Kahn methods, as the amount of reagin in the blood serum of infected animals can be estimated easily and more accurately by means of a photometer.

" Neosalvarsan injections produce, in the blood of infected animals, certain changes in the amount of reagin. In the Vernes reaction these changes are estimated in the photometer and expressed by figures. The combination of figures will form later the serologic curve. The serologic curve in the Vernes reaction is more regular and less fluctuating than the Wassermann and Kahn serologic curves. The changes due to the neosalvarsan injections can be detected sooner and followed more closely in the Vernes reaction than those in the ordinary Wassermann and Kahn methods.

" 4. The Wassermann reaction apparently is not a good method to study the effect of neosalvarsan injections in the blood of infected monkeys on account of the various fluctuations of the Wassermann serologic curve, particularly in previously treated animals."

H. S. S.

GARCIA (Onofre.) **The Effect of Neosalvarsan Treatment on the Late Serologic Reactions of Philippine Monkeys inoculated with Yaws or both Yaws and Syphilis.**—*Philippine Jl. Sci.* 1933. Aug. Vol. 51. No. 4. pp. 425–433. With 3 figs.

The purpose of this research was to study the effect of neosalvarsan treatment on animals that showed strong positive late serological response beyond the limit of time previously tested [this *Bulletin*, Vol. 28, p. 443].

" The serologic curves of the Philippine monkeys inoculated with yaws or both yaws and syphilis and treated with neosalvarsan at the stage of late serologic reactions can be compared favorably with those observed in man under the same conditions.

" Of ten monkeys that were treated and had the infection for about the same length of time, those that had received previous treatment responded more promptly than those that had not received any. In the latter animals, however, there was only a gradual decrease in serologic reactivity with either the Wassermann or Kahn test during a period of two to six months of treatment." *H. S. S.*

GARCIA (Onofre). **Duration of the Serologic Reactions in Monkeys inoculated with Yaws or Syphilis.**—*Philippine Jl. Sci.* 1933. Aug. Vol. 51. No. 4. pp. 409–424.

In previous experiments it was determined that the serological picture in experimental yaws and syphilis consists of two phases, an early serological reaction coinciding with the formation of a primary lesion and a late serological response appearing about six months after inoculation and coinciding with the resistance to superinfection [this *Bulletin*, Vol. 28, p. 443]. The present paper is concerned with the duration of the late serological reactions ; the conclusions are these :—

" The results obtained in the late serologic reactions of the experimental monkeys studied herewith confirm the views regarding sensitization caused by the inoculations of killed or living treponema. The strength of the serologic reaction depends on the degree of sensitization of the tissue as influenced by the extension and duration of lesions or by frequent inoculations. The degree of the serologic reaction, however, is modified by specific treatment." *H. S. S.*

SMITH (E. C.) & ELMES (B. G. T.). **Rosenthal Test (Microprecipitation) in Syphilis and Yaws.**—*Amer. Jl. Trop. Med.* 1933. Nov. Vol. 13. No. 6. pp. 595–598.

The authors record a comparative analysis of the results obtained by the Rosenthal and Kahn tests on 1,000 sera, using for the former the technique described by TULIPAN and DIRECTOR.

Attention is drawn to the value of a test which can be performed rapidly, using a minimum amount of blood, necessitating a simple technique only and therefore can be carried out under the more difficult conditions imposed by tropical practice.

[For method of preparation of the antigen see *Bull. Hyg.*, Vol. 7, p. 448, TULIPAN & DIRECTOR.]

Results were as follows :—

Rosenthal		Kahn				
126 strong positive	gave	53 ++++;	52 +++;	17 ++;	3 +;	1–
256 positive	,,	38 ++++;	114 +++;	78 ++;	14 +;	12–
166 weak positive	,,	8 ++++;	28 +++;	54 ++;	39 +;	37–
85 doubtful	,,	2 ++++;	3 +++;	7 ++;	13 +;	60–
367 negative	,,	0 ++++;	3 +++;	8 ++;	20 +;	336–

H. S. S.

Hasselmann (C. M.). **Immunity in Treponematoses in the Light of Experimental Evidence and Epidemiological Phenomena.**—*Chinese Med. Jl.* 1933. June. Vol. 47. No. 6. pp. 584–586.

A short paper read before the China Medical Association dealing with the theory of immunity in the treponematoses as developed by Schöbl and himself and already summarized in this *Bulletin.* *H. S. S.*

Chu'an-K'uei Hu & Frazier (Chester N.). **A Study of Subcutaneous Nodules of the Juxta-Articular Type observed in Five Cases of Syphilis in North China.**—*Chinese Med. Jl.* 1933. Apr. Vol. 47. No. 4. pp. 364–378. With 4 figs. on 2 plates. [48 refs.]

A paper giving the clinical data pertaining to five patients, all males, four Chinese and one Pole, encountered in the Peiping Union Medical College Hospital during the six years 1925–1931 presenting J.A.N., histological descriptions of biopsy material and observations made in connexion with experimental animals.

All the patients had signs of syphilis and the W.R. was positive in each case. Further the nodules responded to antisyphilitic treatment in all. The histological picture was not considered characteristic of syphilis. No organisms were demonstrated in the nodules but *Sp. pallida* was recovered from a node in one case by rabbit inoculation though failure occurred in a second case.

In the absence of yaws the authors believe that in these cases the nodules were truly syphilitic in origin, and that syphilis is a common cause, among others, of J.A.N. *H. S. S.*

Nobl (G.). Zur Kenntnis der juxtaartikulären Knotenbildung (Jeanselme). [**Formation of J.A.N.**]—*Dermat. Woch.* 1933. July 8. Vol. 97. No. 27. pp. 1008–1012. With 1 fig.

Two cases of typical J.A.N. are described in males aged respectively 40 and 53 years and the pathological findings given. In one there was a doubtful history of syphilis, in the second a history of treated and cured syphilis. The author believes that the assumed syphilitic aetiology in these cases occurring in temperate climate is not justified by the histories obtained and the pathological pictures found.

H. S. S.

Tomikawa (Ryozi). "Nodosités juxta-articulaires." [**J.A.N.**]—*Fukuoka-Ikwadaigaku-Zasshi* (*Fukuoka Acta Med.*). 1933. Aug. Vol. 26. No. 8. [In Japanese pp. 1473–1481. With 6 figs. [28 refs.] German summary pp. 81–84.]

The author describes two cases of J.A.N. in natives of Japan, these being with that of Aramaki the only three cases so far recorded in that country. In case 1 the condition was associated with a syphilitic

polyarthritis and positive W.R. In the second, a woman, there was no history of syphilis and W.R. was negative. Neither had been in the tropics. The histological picture resembled that already described by others. Spirochaetes were not found. *H. S. S.*

COSTE (F.), SAENZ (A.) & COSTIL (L.). Bacilles acido-résistants dans une nodosité juxta-articulaire. [**Acid Resistant Bacilli in a J.A. Nodule.**]—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1933. Nov. 27. 49th Year. 3rd Ser. No. 29. pp. 1369–1373.

The case of a male, aged 60, suffering from a rheumatoid polyarthritis who exhibited symmetrical J.A.N. just below each elbow, in one of which were demonstrated acid-alcohol-fast bacilli non-pathogenic to guineapigs.

The nodules, one on each side, were excised: cholesterol content 2·32 gm. per kilo fresh tissue, urea content 0·086; therefore not a tophus. W.R. negative, therefore not syphilitic. One node presented the well-known characters of J.A.N. The other contained a small caseous area which included many acid-alcohol-fast bacilli. These failed to grow on egg asparagin medium and failed to infect guineapigs. There was a bead of pus at point of inoculation containing the same bacilli and this pus failed to infect guineapigs.

Under the circumstances the authors call the organism a paratuberculosis bacillus and they believe it caused the caseous focus in the nodule but they agree that the question whether they play any part in causing J.A.N. is quite another matter. *H. S. S.*

NATTAN-LARRIER (L.) & GIRARD (G.). Etude histologique des nodosités uratiques des Hovas. [**Histology of the Uratic Nodules of the Hovas.**]—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. pp. 1083–1088. With 4 figs. on 2 plates.

The histological picture found in nodules removed from two natives of Madagascar which the author describes as "nodosités uratiques des Hovas" and for which he proposes the name uratoma (urotome).

The occurrence of these nodules about the joints of the hands and in the pinnae was pointed out by FONTOYNONT, GIRARD & WOLTZ [see this *Bulletin*, Vol. 28, p. 935] under the designation of J.A.N., a use of the term which was not justified as remarked by MONTEL [*loc. cit.* Vol. 30, p. 597]. They are nodes associated with a high blood uric acid content (14 cgm. per litre) of otherwise unknown aetiology rather resembling those of chronic gout, occurring in young adult natives of the high plateaux of Madagascar.

The nodules were the size of hazel nuts. The superjacent skin showed no changes save absence of hair follicles and diminution in the number of sweat glands. The subcutaneous tissue was somewhat thickened and the cells rather larger and more numerous than normal with mononuclear perivascular infiltration. The node consists of a fibrous poorly vascularized capsule with no leucocytic infiltration, but showing a considerable number of distended lymphatics within which lies a second layer of tissue containing few fibres but rich in cells and vessels and deposits of sodium urate. The cells are swollen and irregularly formed, rounded or elongated connective tissue cells of fibroplastic type, others are plasma cells with large highly staining nuclei; there are also a good many giant cells irregularly disposed and uneven in size, polymorphic and containing up to twelve nuclei.

There is a rich network of capillaries whose endothelium shows considerable hyperplasia sufficient in many places to block their lumens, and many visible lymphatic channels filled with mononuclear cells. Some mononuclear cells, a few eosinophilic cells often in little masses, but rare polynuclear cells are also noted. Scattered through this tissue deposits of sodium urate occur; running to these deposits trabeculae are seen made up of flattened connective tissue cells, sometimes in two layers like endothelial cells, carrying with them newly formed blood vessels. The centre of the nodule contains a magma of sodium urate lying in loculi formed by processes of the inner cellular layer of the envelope. Midst this amorphous material are little masses of crystalline urates, 50–90–180 μ in diameter. These will be seen to be undergoing changes towards the amorphous state. There are also masses of cholesterol sometimes in the central mass but more often more peripheral nearer the cellular layer, or along the interlocular trabeculae.

No organism was detected but injection of the contents of nodules on two occasions tubercularized guineapigs, a result which is looked upon as incidental. *H. S. S.*

Butler (C. S.). **Yaws and Syphilis.** [Correspondence.]—*Jl. Amer. Med. Assoc.* 1934. Jan. 13. Vol. 102. No. 2. p. 148.

Apropos of Professor Blacklock's article in this *Bulletin* [Vol. 30, p. 739] "Yaws and Syphilis; Two Diseases or One," Captain Butler complains that his contributions on this subject, a list of which he gives, have not been cited. "The English authorities" he writes, "are unwilling to acknowledge the good work of American investigators." Captain Butler is mistaken; English workers do not overlook the work of Americans, or any other nation as far as it is accessible to them; indeed, of 40 references given by Blacklock 10 came from American journals.

It may be added that Blacklock does not claim to have "proved the proposition that yaws and syphilis are the same thing." What he has done is to call for reconsideration of the general opinion that they are different.

A. G. B.

Giunta (Giuseppe). Sulla trasmissione della Framboesia tropica. Nota epidemiologica.—*Ann. d'Igiene.* 1932. Nov. Vol. 42. No. 11. pp. 767–769.

van der Schaar (P. J.). Framboesia cerebri? en framboesia ossis [Ganter (M.R.)].—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1932. Mar. 1. Vol. 72. No. 5. pp. 269–276. With 3 figs. on 1 plate.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Epstein (G. V.). [**Materials on the Epidemiology of Amoebiasis.**]—*Med. Parasit. & Parasitic Dis.* Moscow. [1933.] Vol. 1. No. 5–6. pp. 200–234. With 1 plate & 5 graphs. [16 refs.] [In Russian.]

This is a critical review of the works of various authors on the epidemiology of amoebiasis, with special reference to symptomless carriers of *Entamoeba histolytica*.

During the last few years a number of observations have been made on the incidence of this parasite in the population of different parts of the Soviet Union. Since the majority of the publications are in Russian the results obtained are summarized in the following table :—

Locality	No. of cases examined	Percentage of *E. histolytica* infections
Leningrad	1,404	25·3
Kola Peninsula	900	60·6
Azerbaidjan	1,146	32·5
Armenia	?	17·7
Georgia	570	32·3
Turkestan	1,064	25·0–40·0

These figures are based almost exclusively on single examinations of stools. Of the total number examined in Leningrad there were 280 cases with digestive trouble ; 60 per cent. of the *E. histolytica* carriers were healthy subjects, while among the others there were only 2 cases of typical dysentery ; 50 per cent. of the " carriers " were local inhabitants who had never left Leningrad.

In 1929, 255 cases of summer diarrhoea were examined in that town, and 14·2 per cent. of these proved to be *E. histolytica* carriers. The figures for the Kola Peninsula are particularly interesting, since the whole of this region is within the Arctic Circle. About half of the cases examined were Russians, the other half being Lapps, Finns, Samoyeds and Zyrians. Amongst the 900 persons examined there was not a single case of dysentery. The author recognizes three species of *Entamoeba* producing 4-nucleated cysts : the larger pathogenic *E. histolytica* and the smaller *E. dispar* and *E. hartmanni*, which are harmless commensals. In analysing the statistics for " carriers " recorded in various parts of the world the author concludes that the only cosmopolitan 4-cysted amoebae, distributed from pole to pole, are the two last-named species. *E. histolytica* is, according to him, limited to warm countries, all cases of true amoebic dysentery found in temperate regions being traceable to imported cases of infection with this parasite. *C. A. Hoare.*

i. Epstein (G. V.) & Zertchaninov (L.). [**On the Distribution of Intestinal Protozoa among the Population of the Ural Region.**]—*Med. Parasit. & Parasitic Dis.* Moscow. [1933.] Vol. 1. No. 5–6. pp. 235–237. [In Russian.]

ii. Peshkov (M.) [**Intestinal Protozoa in the Russian and Bouriat Population of the Selengin Aimak.**]—*Ibid.* pp. 237–239. [In Russian.]

iii. Ter-Matevossian (C. M.). [**Materials for the Study of the Protozoal Fauna of the Human Intestine in Armenia.**]—*Ibid.* pp. 243–245. [In Russian.]

iv. Demina (N.). [**On the Human Intestinal Protozoal Fauna in Soukhoum.**]—*Ibid.* pp. 245–246. [In Russian.]

In these papers are reported the results of examinations of the population in various parts of the Soviet Union for intestinal protozoa. The diagnosis was in all cases based on the examination of the stools. The findings can be summarized in tabular form as follows :—

Authors	Locality	No. of cases examined	Infection rate per cent.							
			Entamoeba histolytica	*E. coli*	*Endolimax nana*	*Iodamoeba büschli*	*Dientamoeba fragilis*	*Trichomonas hominis*	*Chilomastix mesnili*	*Giardia intestinalis*
i	Ural region	726	4·8*	20·5	14·8	14·6		0·2	3·0	11·8
ii	Selengin** district (Siberia)	422		8·55	4·5	4·26		0·23	0·47	9·47
iii	Armenia	1,200	13·8–20·6	32·0–57·0	12·0–17·4	14·3–22·3	2 cases	15·0–31·5	7·0–13·8	8·2–24·0
iv	Soukhoum (Caucasus)	398	1·26	+***	+	+		+	+	4·5

* According to the author's interpretation, this figure comprises *E. hartmanni* 2·7 per cent., and *E. dispar* 2·1.

** The population of this district is composed of Russians and Bouriats : the rate of infection in the latter was found to be 1½ times higher than in the former.

*** The exact number of cases infected with this parasite and of those in the other columns marked + is not stated.

C. A. Hoare.

Gaiskaya (E. L.). [**Distribution of Amoebiasis in Andijan.**]—*Med. Parasit. & Parasitic Dis.* Moscow. [1933.] Vol. 1. No. 5–6. pp. 240–242. [In Russian.]

The examination of various groups of the population of the town of Andijan (Uzbekistan, in Russian Turkestan) revealed the following incidence of amoebic dysentery : out of 586 hospital patients with intestinal symptoms there were 146 (24·9 per cent.) cases, 65·7 per cent. being chronic, and 34·3 per cent. with acute dysentery. Amongst the 1,185 inmates of a hostel for worker-students there were 118 (9·9 per cent.) cases. The examination of 463 factory workers revealed 182 (39·2 per cent.) cases. *C. A. Hoare.*

Paroni (Giuseppe). Amebiasi in Modena e Provincia. Casi autoctoni e casi importati. (Tesi di specializzazione.) [**Amoebiasis in Modena.**]—*Giorn. Ital. di Malat. Esot. e Trop.* 1933. Sept. 30. Vol. 6. No. 9. pp. 227–228, 231–234, 237.

More than two-thirds of this article is devoted to an account of *histolytica* infection in general, its geographical distribution, and the history of the development of knowledge as to its characters and pathogenicity. The last part deals with the prevalence of amoebiasis in the town and province of Modena as gauged by an investigation carried out at the Institute of Colonial Pathology during the academic year 1932–33.

Among patients living in the town itself the author found 24 whose homes were in 17 different streets and two others whose place of residence was not determined—26 in all. In the Province he found 49 from 17 different localities, a total of 75 cases. This is not the first time that cases have been recorded in this Province, for in the course of examinations of faeces carried out at the Institute in 1930–32 there were 29 positive specimens from 11 individuals. *H. H. S.*

Wakeshima (Tadasu) & Koo (Chiden). **Examinations for Intestinal Protozoa, with Special Reference to the Carriers of** *Entamoeba histolytica*, **in North-Formosan Rural Communities.**—*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1933. July. Vol. 32. No. 7. (340). [In Japanese pp. 1034–1038. [21 refs.] English summary p. 93.]

The stools of 139 people were examined once only, by simple smear method in Donaldson's solution. The protozoa were found in encysted form only. *Entamoeba histolytica* 11·51 per cent.; *E. coli* 13·67; *Endolimax nana* 2·88; *Iodamoeba bütschlii* 1·44; *Giardia intestinalis* 2·16. *H. M. Hanschell.*

Biggam (A. G.) & Ghaloungui (Paul). **Amoebic Liver Affection: Symptoms and Treatment, with a Review of 25 Cases.**—*Jl. Trop. Med. & Hyg.* 1933. Sept. 15. Vol. 36. No. 18. pp. 270–275.

This paper is a careful analysis and review of 25 cases of amoebic involvement of the liver.

The rarity of its occurrence in females is stressed—in the authors' view this is not influenced by alcohol or nature of food, but rather by less exposure to and occurrence of amoebic intestinal infection. The average case age was 35, but amoebic abscess of liver was found in one 3 months old patient. In only 52 per cent. of cases was there history of dysentery. Fever was often absent. Average leucocyte count was 17,000, polymorphonuclears 70 per cent., lymphocytes 22 per cent., hyalines 5 per cent., eosinophils 1 per cent. In three cases the abscess extended to lung; in three to parietes; one ruptured into the peritoneal cavity.

The authors emphasize the importance of subcutaneous injection of emetine. They describe two cases where liver abscess developed during other recognized methods of treatment of intestinal amoebiasis. If the condition of the patient allows of delay, emetine injection prior to aspiration is advisable. To ascertain the effect of emetine on the myocardium blood pressure records should be made daily. The point to select for aspiration is the point of maximum tenderness.

Examination of pus at time of aspiration proved valuable in determining the line of treatment. Numerous pus cells and bacteria make open operation advisable. In some cases, however, despite presence of a few pus cells and bacteria, aspiration with emetine injections brought about cure. *H. M. H.*

Lund (Charles C.) & Ingham (Thomas R.). **Four Fatal Cases of Unsuspected Amebiasis. Preliminary Report on One Aspect of the Recent Chicago Epidemic.**—*Jl. Amer. Med. Assoc.* 1933. Nov. 25. Vol. 101. No. 22. pp. 1720–1722.

The amoebic nature of the infection in these four fatal cases was not recognized in time for treatment to be effective. The infection was probably received from carriers working in the kitchen of a Chicago hotel. These cases were among a number of other cases of acute colitis occurring among 125 members of the lumber trade who met in conference in Chicago. In all cases the symptoms began after the meeting was over and its members scattered all over the U.S.A. and Canada. *H. M. H.*

Reeves (Robert J.) & Apple (Elbert D.). **The Use of Thorium Dioxide in the Diagnosis of Liver Abscess.**—*Jl. Amer. Med. Assoc.* 1933. May 27. Vol. 100. No. 21. pp. 1682–1683. With 2 figs.

The authors claim that the report of this case will serve to illustrate the value of hepatolienography as an aid to diagnosis of liver abscess.

The patient complained of pain in the right upper abdomen. The diarrhoeic stools revealed *E. histolytica*. Thorium dioxide was given in 12 cc. doses by intravenous injection, with a total dosage of 72 cc. over a period of fourteen days. Three days after the last injection X-ray examination disclosed a markedly enlarged liver and a large rounded area of diminished density situated in the posterior portion of the liver. This abscess was aspirated and 300 cc. of pus evacuated. [The X-ray photo shows the abscess in unusually well defined outline.]

H. M. H.

Poindexter (Hildrus A.). **The Puerto Rican Strain of *Endameba histolytica*. Comparison of the Diagnostic Value of Direct Smear Examination and Cultivation with Pathogenicity Test.**—*Puerto Rico Jl. of Public Health & Trop. Med.* 1933. Sept. Vol. 9. No. 1. pp. 31–36. [Spanish version pp. 37–43.]

This paper records preliminary work directed to explain the anomaly of a high carrier incidence of *E. histolytica* in Porto Rico with a low incidence of clinical amoebiasis.

The explanation the author thinks must lie within one of three categories : (*a*) the endamoebae of Porto Rico though morphologically and in some respects culturally resembling *E. histolytica* are not really the pathogenic species that cause acute amoebiasis ; (*b*) the people being long in contact with the specific protozoa and having a high incidence of infestation with the closely related protozoa, have developed some degree of specific as well as group immunity ; (*c*) the high carbohydrate diet of the Islanders tends to decrease the activity of the endamoebae without interfering with their life cycle.

The author found experimentally that cultural and microscopical examination of Porto Rican strains of *E. histolytica* revealed a high positive correlation. The cultural method was superior because in doubtful cases *E. histolytica* may be more easily differentiated from *E. coli* in the vegetative stage than in the encysted stage. The Porto Rican strain of vegetative *E. histolytica* showed less pathogenicity in kittens fed on a high carbohydrate diet, than the United States strain injected into the kittens of same age fed on a high protein diet. Puppies fed on high carbohydrate diet tolerated the infection, even though some showed active trophozoites in the stools for several days.

H. M. H.

Acton (H. W.). *Entamoeba histolytica* **Carriers and their Treatment.** —*Trans. Roy. Soc. Trop. Med. & Hyg.* 1933. July 28. Vol. 27. No. 2. pp. 119–126.

The author classifies carriers into three definite types :—

1. Coprozoic carriers with no lesions and no symptoms.
2. Pathogenic carriers with lesions and slight symptoms.
3. Mixed carriers which have also bacilli of the dysentery group.

The routine treatment was administration of bismuth emetine iodide. Most of the failures occurred in the mixed carrier group, and for these a preliminary of autogenous vaccine was given—the vaccine prepared from the causative organism of the bacillary infection. Carbarsone tried on 50 carrier cases has given good results.

H. M. H.

Chopra (R. N.), Sen (B.) & Sen (S.). **Treatment of Chronic Intestinal Amoebiasis with Carbarsone.**—*Indian Med. Gaz.* 1933. June. Vol. 68. No. 6. pp. 315–319.

Carbarsone (4-carbamino-phenyl-arsinic acid) is a white crystalline solid containing 28·85 per cent. of arsenic. The compound is amoebicidal. It is given in doses of 0·25 gm. ($3\frac{3}{4}$ grains) in gelatine capsules twice daily.

In a series of 31 cases, here reported, a ten-day course cured 23 patients ; 4 remained indeterminate ; and 4 remained uncured. The proportion of probable cures to failures in this series was 5·75 : 1, as compared with 3·5 : 1 obtained by Knowles in a similar series with emetine bismuth iodine, and 3·16 : 1 obtained by Acton and Chopra with kurchi bismuthous iodide. Carbarsone produced no untoward effects in the doses administered.

H. M. H.

Fitzgerald (G. H.). **Gavano. A New Specific for Amoebic Dysentery.** —*Indian Med. Gaz.* 1933. Aug. Vol. 68. No. 8. pp. 458–459.

This paper reports satisfactory immediate results of treatment by gavano in 3 cases of amoebic dysentery and one case of hepatic abscess. The drug was given by mouth, one 0·25 gm. tablet twice daily.

Gavano is a new Bayer synthetic preparation, claimed to have specific action on *E. histolytica* ; to produce no vomiting ; to be far less toxic than emetine (therapeutic index tested on cats is 1 : 3) ; no cumulative action ; acts on medullary centres causing lowering of

blood pressure and diminished CO_2 elimination, with increase of vagal activity and increase of peristalsis of large intestine.

Gavano has proved to be remarkably effective in treatment of amoebic dysentery in cats. *H. M. H.*

David (N. A.), Johnstone (H. G.), Reed (A. C.) & Leake (C. D.). **The Treatment of Amebiasis with Iodochlorhydroxyquinoline (Vioform N.N.R.).**—*Jl. Amer. Med. Assoc.* 1933. May 27. Vol. 100. No. 21. pp. 1658–1661.

This paper records the success of Vioform N.N.R. in treatment of amoebiasis.

The authors state that Chiniofon N.N.R., which is sodium iodohydroxyquinoline sulphonate, has been widely exploited under various trade marked names (" yatren," " anayodin ") as a relatively non-toxic and supposedly efficient amoebicide. They protest that this compound was selected for clinical exploitation without any demonstration of its advantages over other halogenated oxyquinolines.

The authors claim that the clinical trial of Vioform N.N.R. in human amoebiasis is justified on the results of its experimental chemotherapeutic comparison with Chiniofon N.N.R. A total dose of 15 grams given orally in two courses of 0·75 gm. daily for ten days with a week's rest between clears the stools of *E. histolytica* in an average case. It is dispensed in capsules of 0·25 gm. each.

In 47 unselected cases of human amoebiasis administration of Vioform N.N.R. in the dosage recommended resulted in clinical cure in 38 cases, as determined by frequent stool examination during three to six months follow up. No evidence of toxicity was noted in any patient. *H. M. H.*

St. John (J. H.). **The Effect of Emetin on *Endamoeba histolytica* in Culture.**—*Amer. Jl. Hyg.* 1933. Sept. Vol. 18. No. 2. pp. 414–432. With 5 charts.

By using a special heart broth medium of low protein content to which wheat starch was added, and in which *Entamoeba histolytica* grew readily, the author has determined that emetine kills the amoebae from ten to fifty times more readily when the medium is kept alkaline than when it is acid.

In a dilution of one in a million it killed the amoebae regularly in two to three days in alkaline medium, while in the case of two or three strains death occurred in three or four days with a dilution of one in five million. *C. M. Wenyon.*

Andrews (Justin), Johnson (Carl M.) & Schwartz (Seymour C.). **The Use of Fecal Extracts in the Cultivation of *Endamoeba histolytica*.**—*Amer. Jl. Trop. Med.* 1933. Nov. Vol. 13. No. 6. pp. 591–593.

By mixing one part of human faeces with 4 parts of Ringer's or Locke's solution or physiological saline to which serum was added, and then straining and filtering to remove bacteria, an extract was obtained which, added to certain culture media, favoured the growth of *Entamoeba histolytica*. The extract does not deteriorate in 4 weeks at room temperature but is rendered inert by boiling though not by heating at 60°C. for 30 minutes. The action of the substance does not rest on any change in the growth of bacteria. *C. M. Wenyon.*

Frye (William W.) & Meleney (Henry E.). **Studies of *Endamoeba histolytica* and Other Intestinal Protozoa in Tennessee : VI. The Influence of the Bacterial Flora in Cultures of *E. histolytica* on the Pathogenicity of the Amoebae.**—*Amer. Jl. Hyg.* 1933. Nov. Vol. 18. No. 3. pp. 543–554.

Though it is well known that injection of cultures of *Entamoeba histolytica* into the large intestine of kittens will frequently give rise to amoebic dysentery, the part played by the bacteria or other substances present in the medium has never been determined. In the experiments recorded in this paper, the authors have found that the frequency with which dysentery is produced is greatly reduced if before injection the amoebae are washed free of most of the bacteria and other material by centrifuging in serum-Ringer solution. Though injection of the washings free from amoebae did not produce dysentery it is concluded that the bacteria or other substances present in the media play a part in the production of lesions. Nevertheless, there still exists a difference in pathogenicity between different strains of amoebae.

C. M. Wenyon.

Daspect (M.) & Jonchères (H.). Action favorisante de l'hémoglobine sur la culture d'*Entamoeba dysenteriae.* [**Haemoglobin in Cultivation of *E. histolytica.***]—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. pp. 995–999.

Deschiens (R.). Influence des hématies et de l'hémoglobine des mammifères sur les cultures d'amibes dysentériques.—*Ibid.* pp. 999–1002.

If instead of adding egg albumin or horse serum to the liquid part of media for the cultivation of *Entamoeba histolytica* there is substituted solution of haemoglobin to give a strength of 0·5 to 2 parts per litre the growth of the amoebae will be improved. *C. M. Wenyon.*

Alexeieiff (A.). Phagocytose chez l'*Entamoeba histolytica.* [**Phagocytosis in *E. histolytica.***]—*Bull. Soc. Path. Exot.* 1933. July 12. Vol. 26. No. 7. pp. 909–913. With 1 fig.

The author has observed the ingestion of red blood corpuscles by *Entamoeba histolytica* and finds that the whole process occupies but some fraction of a second. The corpuscle in contact with the amoeba is as it were suddenly sucked through a small opening which constricts it to a dumb-bell shape during its passage to the endoplasm. In movement forwards the amoeba either glides with or without an ectoplasmic pseudopodium or progresses by means of an axial cytoplasmic current in the direction of movement and peripheral currents in the reverse direction. In the cytoplasm can be seen micro- and macro-somes enclosed in small vacuoles. Often at the posterior end of an amoeba are large vacuoles formed by an active process of engulfing droplets of water, a kind of hydrophagocytosis. *C. M. Wenyon.*

Simić (Tsh.). L'infection spontanée et expérimentale du chien par l'*Entamoeba coli.* [**Natural and Experimental Infection of the Dog with *Ent. coli.***]—*Ann. Parasit. Humaine et Comparée.* 1933. Sept. 1. Vol. 11. No. 5. pp. 329–338.

Having found during certain experiments with young dogs that one animal had a natural infection with *Entamoeba coli,* and that another

animal injected *per rectum* with human material containing *E. dispar* (*E. histolytica*) and *E. coli* became infected with both these amoebae, the author attempted to infect 25 other dogs under two months of age. Human material containing *E. coli* was either fed to the animals or injected *per rectum*. Four of the dogs contracted the infection. Both methods of administering the material succeeded. The infection, which was quite innocuous, lasted at most seven days.

C. M. Wenyon.

Bacillary Dysentery.

Soule (M. H.) & Heyman (Anne M.). **Bacteriological and Serological Study of 89 Cases of Dysentery in which** *B. dysenteriae* **Flexner and** *B. dysenteriae* **Castellani-Sonne were isolated as the Causative Agents.**—*Jl. Trop. Med. & Hyg.* 1933. Oct. 2. Vol. 36. No. 19. pp. 281–289. [80 refs.]

The title of this article describes exactly the outcome of the investigation, which utilized exact morphological, cultural and serological tests for identification of the organisms isolated. The outbreak was in Michigan.

An interesting point which emerges in the discussion is " that plain agar medium . . . gave excellent results in the differential study of the colonies," although the authors " ordinarily select eosin-methylene-blue or Endo's medium for this type of work." A grouping was made of the cultures on the basis of fermentation reaction, colony type and serological response. These types do not correspond to those of Thjøtta. An acute epidemic comprising 89 cases furnished the material. Of these 84 patients were under 8 years of age and 64 less than 2 years old. In their summary, the authors give as their results that :—" Type I appears to be indentical . . . with *B. dysenteriae*, Flexner, . . . occurring in 26 cases, eight of which terminated fatally. Type II corresponds, colony formation excepted, to *B. metadysenteriae* Castellani and is identical with *B. dysenteriae* Sonne. Members of this group were isolated from 17 cases . . . severe . . . but not fatal. Type III, based on fermentation reactions ; the members of this group are very closely related to *B. morgani*. However, from the observation that this type was present in four of the fatal infections in which the Flexner organism was the causative agent, it is considered that Type III is a variant of Type I." *W. F. Harvey.*

Farran-Ridge (C.) & Lush (Dora). **A Bacteriological Investigation of Asylum Dysentery occurring at Mont Park.**—*Med. Jl. Australia.* 1933. Dec. 2. 20th Year. Vol. 2. No. 23. pp. 743–745.

It is most necessary, in the domain of preventive medicine, to assess the degree of efficacy of stock measures instead of being content with the general statement that they are considered to be efficacious. The most important part of this communication is the intimation of a trial of prophylactic vaccine with the proper alternate-case, unvaccinated controls and—be it noted—in anticipation of the appearance of the expected annual outbreak. A preliminary research has been made to determine the organisms locally concerned with this scourge of all asylums, asylum dysentery. Two types of organism were isolated, *Bact. dysenteriae* (Flexner) and *Bact. dysenteriae* (Sonne). The vaccine contained 75 per cent. of the former and 25 per cent. of the latter and a

strength of 1,000 million organisms per cc. Three doses of 0·5, 1 and 1 cc. " have been given at seven-day intervals to about 160 patients in wards especially liable to infection, an equal number being left unvaccinated as controls." *W. F. Harvey.*

Shiga (K.). Zur Einteilung und Benennung der Dysenteriebazillen. [**Classification and Nomenclature of the Dysentery Bacilli.**]—*Zent. f. Bakt.* I. Abt. Orig. 1933. Nov. 1. Vol. 130. No. 1/2. pp. 1–11.

The proposal of the discoverer of the most outstanding of the dysentery bacilli ought to be entitled to special respect. His proposal is for unification of types. On the whole the grouping made and the names allotted are simple and the claims of priority are also taken into consideration. The following table makes this clear and is self-explanatory:

Classification of Dysentery Bacilli

According to Lentz	1 Shiga-Kruse bacillus	2 Schmitz bacillus	3 Flexner Group			4 Kruse-Sonne bacillus
			Flexner	Y	Strong	
Litmus Mannite	blue	blue	red	red	red	red
Indole	−	+	+	±	±	+
Milk	no coagulation	no coagulation	no coagulation			coagulation
Litmus lactose	blue	blue	blue			red
Special toxin	+	−	−	−	−	−
According to Shiga	(1) B. dysent.	(2) Bacillus metadysenteriae				(3) B. paradysent.

In the grouping made by Shiga the metadysentery bacilli closely resemble the dysentery bacillus, differing from it in the absence of specific toxin formation, their fermentation of mannite, their indole formation and specific agglutination. The Schmitz bacillus is a form transitional between *Bact. dysenteriae* and *Bact. metadysenteriae* as regards fermentation of mannite. The paradysentery bacillus is separated from the dysentery bacillus by lactose fermentation, which characteristic places it between the colon bacillus and the metadysentery bacillus. Shiga, therefore, proposes that the dysentery bacilli should be divided into groups named (1) dysentery, (2) metadysentery, and (3) paradysentery. *W. F. Harvey.*

Des Essarts (J. Quérangal). Le bactériophage dans une épidémie de dysenterie bacillaire. (Applications thérapeutiques et prophylactiques.) [**Therapeutic and Prophylactic Use of Bacteriophage in Epidemic Dysentery.**]—*Bull. Soc. Path. Exot.* 1933. Oct. 11. Vol. 26. No. 8. pp. 979–981.

An account is given of very successful results from a Shiga-Flexner bacteriophage treatment of an epidemic of bacillary dysentery amongst naval cadets on training ships at Brest.

This bacteriophage was obtained from a special laboratory and consisted of controlled strains mixed with strains isolated from the stools of convalescents. Altogether 185 cases were treated. Each patient coming from the epidemic area and showing glairy, bloody stools was given 5 cc. (about 25,000 million) to drink in a glass of alkaline water, 10 cc. on each of two following days and 5 cc. on the 4th day, without any other medication. Soon after ingestion the symptoms subsided and no bacilli could be cultured from the stools 24 hours later, by which time the stools also showed the presence of phage. Cure was rapid and neither complications nor relapses presented themselves.

An example is also given of the use of the bacteriophage prophylactically in young children by dosage with 2 cc. for 4 days. This was successful, as judged by the absence of any attacks in the population treated, although dysentery was prevalent in the neighbourhood.

W. F. Harvey.

Mixed and Unclassed.

Ratcliffe (Herbert L.). **Intestinal Lesions associated with Amebic and Balantidial Infection in Man and Lower Animals.**—*Amer. Jl. Hyg.* 1934. Jan. Vol. 19. No. 1. pp. 68–85. With 15 figs. [22 refs.]

A study of invasion of the intestinal wall by balantidia in the capybara and by amoebae in swine suffering from hog cholera has shown the author that in both cases this is preceded by lesions of the surface initiated by some cytotoxic or necrosing substance elaborated by the protozoa. There was no evidence that the ciliates or amoebae advanced in the tissues before necrosis had occurred.

The extension of the tissue necrosis may be due in part at least to bacteria which invade the primary necrotic areas. Direct extension of the necrotic area may give rise to deep ulcers which, however, may also be formed by rupture of bacterial abscesses of the lymph follicles. By the examination of intestines at varying intervals after death of the host it has been determined that post-mortem penetration will account for organisms isolated or in groups deep in the intestinal wall. The ciliates are able to invade cut edges of the large intestine at autopsy.

C. M. Wenyon.

Hegner (Robert). **Specificity in the Genus Balantidium based on Size and Shape of Body and Macronucleus, with Descriptions of Six New Species.**—*Amer. Jl. Hyg.* 1934. Jan. Vol. 19. No. 1. pp. 38–67. With 55 figs. [30 refs.]

The number of recorded species of Balantidium has been steadily increasing, the sole justification for a new name being frequently the discovery in a new host. On the other hand, many have been recorded without names. It is increasingly evident that some standard data are required for differentiating species.

The author, after examining a number of species and the descriptions of others, believes that in certain cases characteristics involving the shape and size of the body and macronucleus are sufficient to distinguish one species from another provided that at least ten typical specimens are available for study. In other cases it may be necessary to study infections in the natural or experimental hosts or to undertake

cultures commenced from single individuals. The data from these sources will eventually be forthcoming but as a preliminary step the author describes the results obtained by the process of measurement. He goes into these in detail and points out that they have led him to the creation of six new species, viz., *Bal. philippinensis* from *Macacus philippinensis*, *Bal. wenrichi* from *Ateles geoffroyi*, *Bal. cunhamunizi* from *Cebus variegatus*, *Bal. cameli* from *Camelus bactrianus*, *Bal. marsupialis* from *Didelphis marsupialis etensis* and *Bal. struthionis* from *Struthio camelus*.

Amongst the results obtained are indications that the domestic pig probably harbours two species, *Bal. coli* and *Bal. suis*, the former of which is indistinguishable from the ciliates from man and the chimpanzee. *C. M. Wenyon.*

NELSON (E. Clifford). **The Feeding Reactions of *Balantidium coli* from the Chimpanzee and Pig.**—*Amer. Jl. Hyg.* 1933. July. Vol. 18. No. 1. pp. 185–201. With 1 text fig. & 5 figs. on 1 plate. [20 refs.]

With cultures of *Balantidium coli* from the chimpanzee and pig tests were made with a number of substances to discover what was most actively ingested. It was found that the ciliates took in and digested starch most readily and after it red blood corpuscles. This observation is in agreement with the claims that infections with the ciliate can be eradicated by reducing the starch of the diet and that rats are more readily infected experimentally when on a diet rich in carbohydrate.

C. M. Wenyon.

HEGNER (Robert). **Effects of Environmental Changes and Disinfectants and Antiseptics on *Trichomonas hominis* in Culture and in Feces.**—*Amer. Jl. Hyg.* 1934. Jan. Vol. 19. No. 1. pp. 22–37. [14 refs.]

Employing a medium containing Loeffler's dehydrated blood serum and sodium chloride for the cultivation of *Trichomonas hominis*, the author has found that the best growth is obtained at 37°C. when the salt is at a concentration of 0·75 per cent. and the serum at 0·5 per cent. At lower temperatures, even 6°C., growth will occur, but more slowly. The addition of faecal extracts to the medium favours multiplication of the flagellates, but the cultures come to an end more rapidly. As regards disinfectants, both iodine and chlorine added to cultures in the strengths advocated for sterilizing drinking water failed to kill the organisms, probably because of their combination with organic matter. Both of these reagents in stronger solutions, as also picrid acid, mercurochrome, dihydranol and formalin, the last in a concentration of 0·2 per cent., are effective. When 20 cc. of 0·5 per cent. formalin was mixed with 20 gm. of infective faeces the trichomonas were no longer viable in 5 minutes. *C. M. Wenyon.*

HEGNER (Robert). **The Effects of a High Vegetable Protein Diet on the Trichomonad Flagellates of Rats.**—*Amer. Jl. Trop. Med.* 1933. Sept. Vol. 13. No. 5. pp. 535–538.

The feeding of rats on various diets has shown that both vegetable and animal protein are unfavourable to the development of trichomonad flagellates, the former being only a little less active in this direction than the latter. *C. M. Wenyon.*

Sanchis Bayarri (V.). Contribución al estudio de la lambliasis intestinal en la región valenciana. [**Giardiasis in the Valencia Region.**]—*Crónica Méd.* Valencia. 1933. July 15. Vol. 37. No. 796 (3rd Ser. No. 67). pp. 493–501. With 4 figs.

The paper draws attention to the frequent occurrence of lamblia infection in the district of Valencia, especially in children. Treatment by regulated diet and administration of stovarsol or treparsol has given good results. *C. M. Wenyon.*

Buttiaux (René). La lambliase intestinale dans le nord de la France. [**Giardiasis in the North of France.**]—*C. R. Soc. Biol.* 1933. Vol. 114. No. 38. pp. 1173–1174.

The author is of opinion that infections with lamblia have been increasing in number in the north of France during the past four years and that steps should be taken to control this extension. It is amongst the mining population, recruited largely from Poland, that the greatest number of cases occur. *C. M. Wenyon.*

Ter-Matevossian (C. M.) & Tsaturian (A. T.). [**Case of Infection with** *Isospora belli*.]—*Med. Parasit. & Parasitic Dis.* Moscow. [1933.] Vol. 1. No. 5–6. pp. 249–250. With 1 fig. [In Russian.]

The authors record a case of coccidiosis (*Isospora belli*) in a child 5 years old, from Erivan (Caucasus). The patient had been suffering from diarrhoea a fortnight before its stool was submitted for examination. In the faeces were found unsegmented coccidial oocysts, cysts of *Entamoeba coli* and Ascaris eggs, and later Trichomonas and Chilomastix. The child continued passing oocysts during the next six days, after which santonin was administered. This treatment resulted in the discharge of about 6 Ascaris ; the stools became normal, but solitary oocysts could still be found during the week following treatment. The sporogony of the parasite was followed up to the final stages, and it proved to be *Isospora belli* Wenyon, 1923.

C. A. Hoare.

Asher (Maurice) & Kraemer (Manfred). Amebiasis in Northern New Jersey.—*Amer. Jl. Med. Sci.* 1933. Sept. Vol. 186. No. 3. pp. 409–413. [14 refs.]

De Assis (Arlindo). Sobre uma variedade sorologica dos bacillos dysentericos do typo Schmitz (var. " Caxambu ").—*Brasil-Medico.* 1933. Sept. 9. Vol. 47. No. 36. pp. 635–640. German summary.

Boyers (Luther Musson). The Liver in Chronic Human Amebiasis—its Relative Size.—*California & Western Med.* 1933. Oct. Vol. 39. No. 4. pp. 239–241. With 1 fig. & 3 charts.

Bundesen (Herman N.). Rawlings (Isaac D.) & Fishbein (William I.). The Health Hazard of Amebic Dysentery. Report of an Outbreak.—*Jl. Amer. Med. Assoc.* 1933. Nov. 18. Vol. 101. No. 21. pp. 1636–1638.

Burke (G. T.). Chronic Amoebic Infection as a Cause of Ill-Health.—*Indian Med. Gaz.* 1933. Oct. Vol. 68. No. 10. pp. 565–567.

Cibils Aguirre (Raúl) & Saubidet (Enrique J.). Consideraciones sobre tres casos de enterocolitis amebiana.—*Semana Méd.* 1933. Aug. 31. Vol. 40. No. 35 (2068). pp. 608–612. [46 refs.]

DUMONT (R.). Considérations diverses au sujet de l'épidémie de dysenterie bacillaire, 1931–1932, dans le Kwango (huileries du Congo Belge) et modalités de traitements.—*Ann. Soc. Belge de Méd. Trop.* 1933. Oct. 30. Vol. 13. No. 3. pp. 261–266.

MCKITTRICK (Leland S.). Amoebic Abscess of the Liver without Preceding Diarrhea. Case Report.—*New England Jl. of Med.* 1933. Dec. 21. Vol. 209. No. 25. pp. 1280–1281.

PARONI (Giuseppe). Amebiasi in Modena e Provincia : casi autoctoni e casi importati.—*Arch. Ital. Sci. Med. Colon.* 1933. Nov. 1. Vol. 14. No. 11. pp. 712–720. With 1 fig. English summary (2 lines).

SCANNELL (David D.). A Fatal Case of Amoebic Dysentery. Preliminary Report —*New England Jl. of Med.* 1933. Dec. 7. Vol. 209. No. 23. p. 1171.

STRONG (Richard P.). The Treatment of Amoebic Dysentery.—*New England Jl. of Med.* 1933. Nov. 23. Vol. 209. No. 21. pp. 1071–1073. [11 refs.]

TONNEY (Fred O.), HOEFT (Gerald L.) & SPECTOR (Bertha Kaplan). The Threat of Amebiasis in the Food Handler.—*Jl. Amer. Med. Assoc.* 1933. Nov. 18. Vol. 101. No. 21. 1638–1639.

TRABAUD (J.). Amibiase et système vago-sympathique.—*Bull. Acad. Méd.* 1934. Jan. 23. 98th Year. 3rd Ser. Vol. 111. No. 3. pp. 142–144.

TROWELL (H. C.). Observations on Dysentery in Nairobi. With Bacteriological Notes by F. P. G. DE SMIDT.—*East African Med. Jl.* 1933. Dec. Vol. 10. No. 9. pp. 265–275.

REVIEWS AND NOTICES.

HERMANS (E. H.). **Framboesia tropica.**—*Acta Leidensia* (*Scholae Med. Tropicae*). 1931. Vol. 6. 168 pp. With 37 figs. on 10 plates. [426 refs.]*

The author observes that in gathering "all that is known at the present time" about framboesia he is actuated by the consideration that the clinical picture of the disease may presently be modified by the therapeutic attack upon it which is everywhere being made; in case this attack should have the effect of exterminating yaws within a short period of time—which the author does not believe to be possible—his work, he hopes, will have an historical value.

The volume begins with a chapter on historical aspects of the disease. Those who are interested in older comments on the framboesia-syphilis problem will find in this monograph a number of references to publications, especially in Dutch, which are not readily accessible and which are not very frequently quoted; there are 426 publications cited under Literature.

A geographical survey forms the second chapter, at the end of which the author gives an "incomplete list of the names used in various countries for framboesia"; the number of names given amounts to over fifty.

The primary stage, the secondary stage, sole and palm framboesia, and tertiary stage, each occupy a chapter. Tertiary affections of the skin, bones, joints and internal organs, and rhinopharyngitis mutilans, juxta-articular nodules and goundou, are next dealt with in order. The last chapters are on immunity and serum reactions, popular medicines and beliefs, and therapy.

In answer to the question "Are syphilis and framboesia the same disease?" which forms the heading of Chapter XVI, the author summarizes his previous chapters in short sections, at the end of each of which his own conclusions are added. The author's final conclusions are as follows:—

"Gathering all our arguments and knowledge together I consider that we have every right to look upon lues and framboesia as two different diseases. It is now not difficult to ascertain whether lues or framboesia or both occur in a certain district. And as far as we can look back into history we find these two diseases alongside each other, the one never passing over into the other. The fact that framboesia is only a tropical and lues a cosmopolitan disease is of essential importance.

"As far as I can judge I should think it only confusing to look upon lues and framboesia as one and the same thing. The fact that in certain cases striking similarity may exist is not of course of any scientific value.

"On the other hand we cannot be blind to the many points of similarity which exist between the two diseases, and it is not impossible that framboesia and syphilis have generated from one and the same form of disease."

D. B. Blacklock.

UNION OF SOCIALIST SOVIET REPUBLICS. **Wissenschaftliche Literatur der UdSSR, 1928. Systematischer Anzeiger der Bücher und zeitschriftlichen Aufsätze. Medizin.** [Scientific Literature of the U.S.S.R., 1928. Medicine.]—pp. xxii+[739]+lxxvii. 1931. Moscow.

The comprehensive cataloguing of the scientific literature of the world, a project generally recognized as desirable, requires as a

* Copies may be obtained at the Leiden Institute of Tropical Medicine (Rapenburg 33, Leiden) price 6 shillings.

beginning that countries shall undertake to collect by local organization the material relating to their own national literature. Once national bibliographies are available, their bringing together to form an international record of the world's scientific output becomes possible. Working on these lines the organizers of the " International Catalogue of Scientific Literature," before the European War of 1914–18, had set up regional bureaux in various co-operating countries to collect titles of original contributions to scientific literature published within their national boundaries. The conditions resulting from the War brought this international organization to an end in 1915, and unfortunately most countries have allowed the cataloguing of their scientific literature to lapse. Soviet Russia is an exception, for, as an essential part of their second five-year plan, the All-Union Central Executive Committee of the U.S.S.R. established Commissions to compile indexes of current Russian literature, including the literature of science and agriculture.

The volume under review, which is one of a series of volumes relating to Russian scientific literature, contains a bibliography of Russian medical literature published during 1928. The main part of the work, including brief abstracts of the more important papers noted, is in Russian, but the classified list of contents and the titles of papers are given also in German for the convenience of non-Russian users. Entries are grouped so that papers on like subjects are brought together, and there are alphabetical authors' and subject indexes. In all 231 Russian medical journals have been indexed and 11,012 titles of medical papers published in Russia during 1928 have been noted. In comparison with other European countries, the size and complexity of the U.S.S.R. make the task of compiling yearly indexes of its scientific literature a gigantic one. Friends of the Soviet Union will claim that successful achievement is made possible by reason of the form of socialized Government within the Union, in which scientists and doctors are State officials and scientific and medical publications are part of the machinery of State. Whatever view is taken, the preparation of such national bibliographies of scientific literature is a service to the progress of science that other Governments might well copy. *R. L. S.*

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